

x320 Series

GIGABIT LAYER 3 POE++/POE PASS-THROUGH SWITCHES

x320-10GH
x320-11GPT

x320-10GH
x320-11GPT



Command Reference for AlliedWare Plus™ Version 5.5.5-2.1

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Contents

Preface:	Acknowledgments.....	ii
PART 1:	Setup and Troubleshooting.....	46
Chapter 1:	CLI Navigation Commands.....	47
	Introduction.....	48
	configure terminal.....	49
	disable (Privileged Exec mode).....	50
	do.....	51
	enable (Privileged Exec mode).....	52
	end.....	54
	exit.....	55
	help.....	56
	logout.....	57
	show history.....	58
Chapter 2:	Device GUI and Vista Manager EX Commands.....	59
	Introduction.....	60
	atmf topology-gui enable.....	61
	http check-api-content-type-header.....	63
	http log webapi-requests.....	64
	http port.....	65
	http secure-port.....	67
	http tls-version-minimum.....	69
	http trustpoint.....	70
	log event-host.....	72
	service http.....	73
	show http.....	74
Chapter 3:	File and Configuration Management Commands.....	75
	Introduction.....	77
	autoboot enable.....	79
	boot config-file.....	80
	boot config-file backup.....	82
	boot system.....	83

boot system backup.....	85
cd.....	86
copy (filename).....	87
copy debug.....	89
copy running-config.....	90
copy startup-config.....	91
copy zmodem.....	92
create autoboot.....	93
crypto verify.....	94
crypto verify bootrom.....	96
crypto verify signed.....	98
delete.....	100
delete debug.....	101
dir.....	102
edit.....	104
erase factory-default.....	106
erase startup-config.....	107
ip tftp source-interface.....	108
ipv6 tftp source-interface.....	109
mkdir.....	110
move.....	111
move debug.....	112
pwd.....	113
rmdir.....	114
show autoboot.....	115
show boot.....	116
show hash.....	118
show file.....	119
show file systems.....	120
show running-config.....	123
show running-config interface.....	127
show running-config unencrypted.....	131
show startup-config.....	132
show version.....	133
strict-user-process-control.....	134
strict-user-process-control force.....	135
unmount.....	136
write file.....	137
write memory.....	138
write terminal.....	139

Chapter 4: User Access Commands.....140

Introduction.....	142
aaa authentication enable default local.....	143
aaa local authentication attempts lockout-time.....	144
aaa local authentication attempts max-fail.....	145
aaa login fail-delay.....	147
clear aaa local user lockout.....	148
clear line console.....	149
clear line vty.....	150
enable password.....	151
enable secret (deprecated).....	153
exec-timeout.....	154
flowcontrol hardware (asyn/console).....	156
length (asyn).....	158
line.....	160

privilege level.....	162
security-password history.....	163
security-password forced-change.....	164
security-password lifetime.....	165
security-password min-lifetime-enforce.....	166
security-password minimum-categories.....	168
security-password minimum-length.....	170
security-password reject-expired-pwd.....	171
security-password warning.....	173
service advanced-vty.....	174
service password-encryption.....	175
service telnet.....	176
service terminal-length (deleted).....	177
show aaa local user locked.....	178
show privilege.....	180
show security-password configuration.....	181
show security-password user.....	182
show telnet.....	183
show users.....	184
strict-user-process-control.....	185
strict-user-process-control force.....	186
telnet.....	187
telnet server.....	188
terminal length.....	189
terminal resize.....	190
username.....	191

Chapter 5: Feature Licensing Commands..... 195

Introduction.....	196
license.....	197
show license.....	199
show license brief.....	201

Chapter 6: System Configuration and Monitoring Commands..... 203

Introduction.....	205
banner display external-manager.....	206
banner exec.....	207
banner external-manager.....	209
banner login (system).....	211
banner motd.....	212
clock set.....	214
clock summer-time date.....	215
clock summer-time recurring.....	217
clock timezone.....	220
continuous-reboot-prevention.....	221
crypto secure-mode.....	223
debug core-file.....	224
ecofriendly led.....	225
ecofriendly lpi.....	226
findme.....	228
findme trigger.....	230
hostname.....	231
low-memory restart.....	233
max-fib-routes.....	234
max-static-routes.....	235

no debug all.....	236
reboot.....	238
reload.....	239
show banner external-manager.....	240
show clock.....	241
show continuous-reboot-prevention.....	243
show cpu.....	244
show cpu history.....	247
show debugging.....	249
show ecofriendly.....	250
show interface memory.....	252
show memory.....	254
show memory allocations.....	257
show memory history.....	259
show memory pools.....	260
show memory shared.....	261
show process.....	262
show reboot history.....	265
show router-id.....	267
show secure-mode.....	268
show system.....	269
show system environment.....	270
show system environment counters.....	272
show system interrupts.....	275
show system mac.....	276
show system pci device.....	277
show system pci tree.....	278
show system psu config.....	279
show system serialnumber.....	280
show tech-support.....	281
speed (asyn).....	284
system psu unused.....	286
terminal monitor.....	288
undebg all.....	289

Chapter 7: Pluggables and Cabling Commands..... 290

Introduction.....	291
clear fiber-monitoring interface.....	292
clear test cable-diagnostics tdr.....	293
debug fiber-monitoring.....	294
fiber-monitoring action.....	296
fiber-monitoring baseline.....	298
fiber-monitoring enable.....	300
fiber-monitoring interval.....	301
fiber-monitoring sensitivity.....	302
show system fiber-monitoring.....	304
show system pluggable.....	307
show system pluggable detail.....	309
show system pluggable diagnostics.....	314
show test cable-diagnostics tdr.....	317
test cable-diagnostics tdr interface.....	318

Chapter 8: Connectivity Fault Management Commands..... 319

Introduction.....	320
cc interval.....	321

cc multicast.....	323
cc unicast.....	325
clear (MEP Attribute).....	326
clear ethernet cfm errorlog.....	327
clear mep counter.....	328
ethernet cfm domain-name.....	329
ethernet cfm mep.....	333
mep (FNG attributes).....	336
mep active.....	338
mep ccm-ltm-priority.....	340
mep crosscheck.....	342
service ma-name.....	345
show ethernet cfm details.....	349
show ethernet cfm domain.....	353
show ethernet cfm errorlog.....	356
show ethernet cfm maintenance-points local mep.....	359
show ethernet cfm maintenance-points remote mep.....	364
show ethernet cfm service.....	368
show mep-alarm status.....	371

Chapter 9: Logging Commands..... 373

Introduction.....	375
clear exception log.....	376
clear log.....	377
clear log buffered.....	378
clear log external.....	379
clear log permanent.....	380
copy buffered-log.....	381
copy permanent-log.....	382
default log buffered.....	383
default log console.....	384
default log email.....	385
default log external.....	386
default log host.....	387
default log monitor.....	388
default log permanent.....	389
log buffered.....	390
log buffered (filter).....	391
log buffered exclude.....	396
log buffered size.....	400
log console.....	401
log console (filter).....	402
log console exclude.....	407
log email.....	411
log email (filter).....	412
log email exclude.....	417
log email time.....	421
log external.....	423
log external (filter).....	425
log external exclude.....	430
log external rotate.....	435
log external size.....	437
log facility.....	438
log host.....	440
log host (filter).....	442
log host exclude.....	447

	log host source.....	452
	log host startup-delay.....	453
	log host time.....	455
	log monitor (filter).....	457
	log monitor exclude.....	462
	log permanent.....	466
	log permanent (filter).....	467
	log permanent exclude.....	472
	log permanent size.....	476
	log-rate-limit nsm.....	477
	log trustpoint.....	479
	show counter log.....	481
	show exception log.....	483
	show log.....	484
	show log config.....	486
	show log external.....	489
	show log permanent.....	490
	show running-config log.....	492
	unmount.....	493
Chapter 10:	Scripting Commands.....	494
	Introduction.....	495
	activate.....	496
	echo.....	498
	wait.....	499
Chapter 11:	Interface Commands.....	500
	Introduction.....	501
	description (interface).....	502
	interface (to configure).....	503
	mtu.....	505
	platform jumboframe.....	507
	service statistics interfaces counter.....	508
	show interface.....	509
	show interface brief.....	512
	show interface memory.....	513
	show interface status.....	515
	shutdown.....	518
Chapter 12:	Port Mirroring and Remote Mirroring Commands.....	519
	Introduction.....	520
	mirror interface.....	521
	remote-mirror interface.....	524
	show mirror.....	527
	show mirror interface.....	528
	show remote-mirror.....	529
	switchport remote-mirror-egress.....	532
	vlan mode remote-mirror-vlan.....	533
PART 2:	Interfaces and Layer 2.....	535
Chapter 13:	Switching Commands.....	536
	Introduction.....	538

backpressure.....	539
clear loop-protection action.....	541
clear loop-protection counters.....	542
clear mac address-table dynamic.....	543
clear mac address-table static.....	545
clear port counter.....	546
clear port-security intrusion.....	547
debug loopprot.....	550
debug platform packet.....	551
duplex.....	553
flowcontrol (switch port).....	555
linkflap action.....	557
loop-protection loop-detect.....	558
loop-protection action.....	560
loop-protection action-delay-time.....	562
loop-protection timeout.....	563
mac address-table acquire.....	564
mac address-table ageing-time.....	565
mac address-table logging.....	566
mac address-table static.....	567
mac address-table thrash-limit.....	568
platform acs-to-vlanclassifiers.....	569
platform control-plane-prioritization rate.....	571
platform jumboframe.....	573
platform l2mc-overlap.....	574
platform l2mc-table mode.....	575
platform load-balancing.....	578
platform multicast-address-mismatch-action.....	580
platform multicast-ratelimit.....	582
platform port-tx-recovery.....	583
platform routingratio.....	584
platform stop-unreg-mc-flooding.....	586
polarity.....	588
show debugging loopprot.....	589
show debugging platform packet.....	590
show flowcontrol interface.....	591
show interface err-disabled.....	592
show interface switchport.....	594
show loop-protection.....	595
show mac address-table.....	597
show mac address-table thrash-limit.....	599
show platform.....	600
show platform classifier statistics utilization brief.....	603
show platform port.....	608
show port-security interface.....	610
show port-security intrusion.....	611
show storm-control.....	612
speed.....	613
storm-control level.....	617
switchport block unicast-flooding.....	619
switchport port-security.....	621
switchport port-security aging.....	623
switchport port-security maximum.....	625
switchport port-security violation.....	627
thrash-limiting.....	629
undebug loopprot.....	631
undebug platform packet.....	632

Chapter 14:	VLAN Commands.....	633
	Introduction.....	635
	debug private-vlan ufo.....	636
	platform acs-to-vlanclassifiers.....	637
	port-vlan-forwarding-priority.....	639
	private-vlan.....	642
	private-vlan association.....	644
	private-vlan ufo trap.....	645
	show debugging private-vlan.....	646
	show port-vlan-forwarding-priority.....	647
	show vlan.....	648
	show vlan access-map.....	649
	show vlan classifier group.....	650
	show vlan classifier group interface.....	651
	show vlan classifier interface group.....	652
	show vlan classifier rule.....	653
	show vlan filter.....	654
	show vlan private-vlan.....	655
	show vlan private-vlan ufo.....	656
	switchport access vlan.....	658
	switchport enable vlan.....	659
	switchport mode access.....	660
	switchport mode private-vlan.....	661
	switchport mode private-vlan trunk promiscuous.....	662
	switchport mode private-vlan trunk secondary.....	664
	switchport mode private-vlan ufo.....	666
	switchport mode trunk.....	668
	switchport private-vlan host-association.....	669
	switchport private-vlan mapping.....	670
	switchport trunk allowed vlan.....	671
	switchport trunk native vlan.....	674
	switchport vlan-stacking (double-tagging).....	676
	switchport voice dscp.....	678
	switchport voice vlan.....	679
	switchport voice vlan priority.....	682
	vlan.....	684
	vlan access-map.....	686
	vlan classifier activate.....	687
	vlan classifier group.....	688
	vlan classifier rule ipv4.....	689
	vlan classifier rule proto.....	690
	vlan database.....	694
	vlan filter.....	695
Chapter 15:	Spanning Tree Commands.....	697
	Introduction.....	699
	clear spanning-tree statistics.....	700
	clear spanning-tree detected protocols (RSTP and MSTP).....	701
	debug mstp (RSTP and STP).....	702
	instance priority (MSTP).....	706
	instance vlan (MSTP).....	708
	region (MSTP).....	710
	revision (MSTP).....	711
	show debugging mstp.....	712

show spanning-tree.....	713
show spanning-tree brief.....	716
show spanning-tree mst.....	717
show spanning-tree mst config.....	718
show spanning-tree mst detail.....	719
show spanning-tree mst detail interface.....	721
show spanning-tree mst instance.....	723
show spanning-tree mst instance interface.....	724
show spanning-tree mst interface.....	725
show spanning-tree statistics.....	726
show spanning-tree statistics instance.....	728
show spanning-tree statistics instance interface.....	729
show spanning-tree statistics interface.....	731
show spanning-tree vlan range-index.....	734
spanning-tree autoedge (RSTP and MSTP).....	735
spanning-tree bpdu.....	736
spanning-tree cisco-interoperability (MSTP).....	738
spanning-tree edgeport (RSTP and MSTP).....	739
spanning-tree enable.....	740
spanning-tree errdisable-timeout enable.....	742
spanning-tree errdisable-timeout interval.....	743
spanning-tree force-version.....	744
spanning-tree forward-time.....	745
spanning-tree guard root.....	747
spanning-tree hello-time.....	748
spanning-tree link-type.....	749
spanning-tree max-age.....	750
spanning-tree max-hops (MSTP).....	751
spanning-tree mode.....	752
spanning-tree mst configuration.....	753
spanning-tree mst instance.....	754
spanning-tree mst instance path-cost.....	756
spanning-tree mst instance priority.....	758
spanning-tree mst instance restricted-role.....	760
spanning-tree mst instance restricted-tcn.....	762
spanning-tree path-cost.....	764
spanning-tree portfast (STP).....	765
spanning-tree portfast bpdu-filter.....	767
spanning-tree portfast bpdu-guard.....	769
spanning-tree priority (bridge priority).....	771
spanning-tree priority (port priority).....	772
spanning-tree restricted-role.....	773
spanning-tree restricted-tcn.....	774
spanning-tree transmit-holdcount.....	775
undebg mstp.....	776

Chapter 16: Unidirectional Link Detection (UDLD) Commands..... 777

Introduction.....	778
debug udld.....	779
show debugging udld.....	780
show udld.....	781
show udld neighbors.....	782
show udld port.....	784
udld aggressive-mode.....	785
udld enable.....	786
udld port.....	787

udld port aggressive-mode.....	788
udld port disable.....	789
udld reset.....	790
udld time disable-period.....	791
udld time message-interval.....	792
undebg udld.....	793

Chapter 17: Link Aggregation Commands..... 794

Introduction.....	795
channel-group.....	796
clear lacp counters.....	798
debug lacp.....	799
lacp global-passive-mode enable.....	800
lacp port-priority.....	801
lacp system-priority.....	802
lacp timeout.....	803
platform load-balancing.....	805
show debugging lacp.....	807
show diagnostic channel-group.....	808
show etherchannel.....	810
show etherchannel detail.....	812
show etherchannel summary.....	813
show lacp sys-id.....	814
show lacp-counter.....	815
show port etherchannel.....	816
show static-channel-group.....	817
static-channel-group.....	818
undebg lacp.....	820

Chapter 18: Power over Ethernet Commands..... 821

Introduction.....	822
clear power-inline counters interface.....	823
debug power-inline.....	824
power-inline allow-legacy.....	826
power-inline autoclass.....	827
power-inline description.....	829
power-inline disconnect-defer.....	830
power-inline enable.....	831
power-inline hanp.....	832
power-inline max.....	833
power-inline pair max.....	835
power-inline priority.....	837
power-inline usage-threshold.....	839
service power-inline.....	840
show debugging power-inline.....	841
show power-inline.....	842
show power-inline counters.....	846
show power-inline interface.....	849
show power-inline interface detail.....	852

Chapter 19: GVRP Commands..... 855

Introduction.....	856
clear gvrp statistics.....	857
debug gvrp.....	858
gvrp (interface).....	860

gvrp dynamic-vlan-creation.....	862
gvrp enable (global).....	864
gvrp registration.....	865
gvrp timer.....	866
show debugging gvrp.....	868
show gvrp configuration.....	869
show gvrp machine.....	870
show gvrp statistics.....	871
show gvrp timer.....	872

PART 3: Layer 3 Switching.....873

Chapter 20: IP Addressing and Protocol Commands..... 874

Introduction.....	876
arp-aging-timeout.....	877
arp-mac-disparity.....	878
arp.....	881
arp log.....	883
arp opportunistic-nd.....	887
arp-loose-check.....	888
arp-reply-bc-dmac.....	890
clear arp-cache.....	891
debug ip packet interface.....	892
debug ip irdp.....	895
ip address (IP Addressing and Protocol).....	897
ip directed-broadcast.....	899
ip forwarding.....	902
ip forward-protocol udp.....	903
ip gratuitous-arp-link.....	905
ip helper-address.....	907
ip irdp.....	909
ip icmp error-interval.....	910
ip icmp-timestamp.....	911
ip irdp address preference.....	912
ip irdp broadcast.....	913
ip irdp holdtime.....	914
ip irdp lifetime.....	915
ip irdp maxadvertinterval.....	916
ip irdp minadvertinterval.....	918
ip irdp multicast.....	920
ip irdp preference.....	921
ip limited-local-proxy-arp.....	923
ip local-proxy-arp.....	924
ip proxy-arp.....	926
ip redirects.....	927
ip tcp synack-retries.....	928
ip tcp-timestamp.....	929
ip unreachable.....	930
local-proxy-arp.....	933
optimistic-nd.....	934
ping.....	935
platform multicast-address-mismatch-action.....	936
router ip irdp.....	938
show arp.....	939
show debugging ip packet.....	941

show ip flooding-nexthops.....	943
show ip forwarding.....	944
show ip interface.....	945
show ip irdp.....	946
show ip irdp interface.....	947
show ip sockets.....	950
show ip traffic.....	954
tcpdump.....	956
traceroute.....	957
undebg ip packet interface.....	958
undebg ip irdp.....	959

Chapter 21: Domain Name Service (DNS) Commands..... 960

Introduction.....	961
clear ip dns forwarding cache.....	962
debug ip dns forwarding.....	963
ip dns forwarding.....	964
ip dns forwarding cache.....	966
ip dns forwarding dead-time.....	968
ip dns forwarding domain-list.....	970
ip dns forwarding retry.....	971
ip dns forwarding source-interface.....	972
ip dns forwarding timeout.....	973
ip domain-list.....	974
ip domain-lookup.....	975
ip domain-name.....	977
ip name-server.....	978
ip name-server preferred-order.....	980
show debugging ip dns forwarding.....	981
show hosts.....	982
show ip dns forwarding.....	984
show ip dns forwarding cache.....	985
show ip dns forwarding server.....	986
show ip domain-list.....	987
show ip domain-name.....	988
show ip name-server.....	989

Chapter 22: IPv6 Commands..... 990

Introduction.....	992
clear ipv6 neighbors.....	993
ipv6 address.....	994
ipv6 address autoconfig.....	996
ipv6 address suffix.....	998
ipv6 enable.....	999
ipv6 eui64-linklocal.....	1001
ipv6 forwarding.....	1002
ipv6 icmp error-interval.....	1004
ipv6 multicast forward-slow-path-packet.....	1005
ipv6 nd accept-ra-default-routes.....	1006
ipv6 nd accept-ra-pinfo.....	1007
ipv6 nd current-hoplimit.....	1008
ipv6 nd dns search-list.....	1009
ipv6 nd dns-server.....	1010
ipv6 nd managed-config-flag.....	1012
ipv6 nd minimum-ra-interval.....	1013

ipv6 nd other-config-flag.....	1014
ipv6 nd prefix.....	1015
ipv6 nd ra-interval.....	1018
ipv6 nd ra-lifetime.....	1019
ipv6 nd rguard.....	1020
ipv6 nd reachable-time.....	1022
ipv6 nd retransmission-time.....	1023
ipv6 nd route-information.....	1024
ipv6 nd router-preference.....	1026
ipv6 nd suppress-ra.....	1027
ipv6 neighbor.....	1028
ipv6 opportunistic-nd.....	1029
ipv6 route.....	1030
ipv6 unreachable.....	1032
optimistic-nd.....	1034
ping ipv6.....	1035
show ipv6 forwarding.....	1037
show ipv6 interface.....	1038
show ipv6 neighbors.....	1039
show ipv6 route.....	1040
show ipv6 route summary.....	1042
traceroute ipv6.....	1043

Chapter 23: Routing Commands..... 1044

Introduction.....	1045
ip resolve-via-default.....	1046
ip route.....	1047
ipv6 route.....	1049
max-fib-routes.....	1051
max-static-routes.....	1052
maximum-paths.....	1053
show ip resolve-via-default.....	1054
show ip route.....	1055
show ip route database.....	1058
show ip route summary.....	1060
show ipv6 route.....	1061
show ipv6 route summary.....	1063

Chapter 24: RIP Commands..... 1064

Introduction.....	1066
accept-lifetime.....	1067
alliedware-behavior.....	1069
cisco-metric-behavior (RIP).....	1071
clear ip rip route.....	1072
debug rip.....	1073
default-information originate (RIP).....	1074
default-metric (RIP).....	1075
distance (RIP).....	1076
distribute-list (RIP).....	1077
fullupdate (RIP).....	1079
ip summary-address rip.....	1080
ip prefix-list.....	1082
ip rip authentication key-chain.....	1084
ip rip authentication mode.....	1086
ip rip authentication string.....	1088

ip rip receive-packet.....	1090
ip rip receive version.....	1091
ip rip send-packet.....	1092
ip rip send version.....	1093
ip rip send version 1-compatible.....	1095
ip rip split-horizon.....	1097
key.....	1098
key chain.....	1099
key-string.....	1100
maximum-prefix.....	1101
neighbor (RIP).....	1102
network (RIP).....	1103
offset-list (RIP).....	1104
passive-interface (RIP).....	1105
recv-buffer-size (RIP).....	1106
redistribute (RIP).....	1107
restart rip graceful.....	1108
rip restart grace-period.....	1109
route (RIP).....	1110
router rip.....	1111
send-lifetime.....	1112
service rip.....	1114
show debugging rip.....	1115
show ip prefix-list.....	1116
show ip protocols rip.....	1117
show ip rip.....	1118
show ip rip database.....	1119
show ip rip interface.....	1120
timers (RIP).....	1121
undebg rip.....	1123
version (RIP).....	1124

Chapter 25: RIPng for IPv6 Commands..... 1125

Introduction.....	1126
aggregate-address (IPv6 RIPng).....	1127
clear ipv6 rip route.....	1128
debug ipv6 rip.....	1129
default-information originate (IPv6 RIPng).....	1130
default-metric (IPv6 RIPng).....	1131
distribute-list (IPv6 RIPng).....	1132
ipv6 prefix-list.....	1133
ipv6 rip metric-offset.....	1135
ipv6 rip split-horizon.....	1137
ipv6 router rip.....	1138
neighbor (IPv6 RIPng).....	1139
offset-list (IPv6 RIPng).....	1140
passive-interface (IPv6 RIPng).....	1141
recv-buffer-size (IPv6 RIPng).....	1142
redistribute (IPv6 RIPng).....	1143
route (IPv6 RIPng).....	1144
router ipv6 rip.....	1145
service ripng.....	1146
show debugging ipv6 rip.....	1147
show ipv6 prefix-list.....	1148
show ipv6 protocols rip.....	1149
show ipv6 rip.....	1150

show ipv6 rip database.....	1151
show ipv6 rip interface.....	1152
timers (IPv6 RIPng).....	1153
undebg ipv6 rip.....	1154

Chapter 26: OSPF Commands..... 1155

Introduction.....	1158
area default-cost.....	1159
area authentication.....	1160
area filter-list.....	1161
area nssa.....	1162
area range.....	1164
area stub.....	1166
area virtual-link.....	1167
area virtual-link authentication.....	1169
area virtual-link authentication message-digest.....	1171
area virtual-link authentication null.....	1173
area virtual-link dead-interval.....	1174
area virtual-link hello-interval.....	1176
area virtual-link retransmit-interval.....	1178
area virtual-link transmit-delay.....	1180
auto-cost reference bandwidth.....	1182
bandwidth.....	1185
capability opaque.....	1186
capability restart.....	1187
clear ip ospf process.....	1188
compatible rfc1583.....	1189
debug ospf events.....	1190
debug ospf ifsm.....	1191
debug ospf lsa.....	1192
debug ospf n fsm.....	1193
debug ospf nsm.....	1194
debug ospf packet.....	1195
debug ospf route.....	1196
default-information originate.....	1197
default-metric (OSPF).....	1199
distance (OSPF).....	1200
distribute-list (OSPF).....	1202
enable db-summary-opt.....	1205
host area.....	1206
ip ospf authentication.....	1207
ip ospf authentication-key.....	1208
ip ospf cost.....	1210
ip ospf database-filter.....	1211
ip ospf dead-interval.....	1212
ip ospf disable all.....	1213
ip ospf hello-interval.....	1214
ip ospf message-digest-key.....	1215
ip ospf mtu.....	1217
ip ospf mtu-ignore.....	1218
ip ospf network.....	1219
ip ospf priority.....	1220
ip ospf resync-timeout.....	1221
ip ospf retransmit-interval.....	1222
ip ospf transmit-delay.....	1223
max-concurrent-dd.....	1224

maximum-area.....	1225
neighbor (OSPF).....	1226
network area.....	1228
ospf abr-type.....	1230
ospf restart grace-period.....	1231
ospf restart helper.....	1232
ospf router-id.....	1234
overflow database.....	1235
overflow database external.....	1236
passive-interface (OSPF).....	1237
redistribute (OSPF).....	1238
restart ospf graceful.....	1240
router ospf.....	1241
router-id.....	1242
service ospf.....	1243
show debugging ospf.....	1244
show ip ospf.....	1245
show ip ospf border-routers.....	1248
show ip ospf database.....	1249
show ip ospf database asbr-summary.....	1251
show ip ospf database external.....	1252
show ip ospf database network.....	1254
show ip ospf database nssa-external.....	1256
show ip ospf database opaque-area.....	1258
show ip ospf database opaque-as.....	1259
show ip ospf database opaque-link.....	1260
show ip ospf database router.....	1261
show ip ospf database summary.....	1263
show ip ospf interface.....	1266
show ip ospf neighbor.....	1267
show ip ospf route.....	1269
show ip ospf virtual-links.....	1270
show ip protocols ospf.....	1271
summary-address.....	1272
timers spf exp.....	1274
undebg ospf events.....	1275
undebg ospf ifsm.....	1276
undebg ospf lsa.....	1277
undebg ospf nfm.....	1278
undebg ospf nsm.....	1279
undebg ospf packet.....	1280
undebg ospf route.....	1281

Chapter 27: OSPFv3 for IPv6 Commands..... 1282

Introduction.....	1284
abr-type.....	1285
area authentication ipsec spi.....	1286
area default-cost (IPv6 OSPF).....	1289
area encryption ipsec spi esp.....	1290
area range (IPv6 OSPF).....	1293
area stub (IPv6 OSPF).....	1294
area virtual-link (IPv6 OSPF).....	1295
area virtual-link authentication ipsec spi.....	1298
area virtual-link encryption ipsec spi.....	1300
auto-cost reference bandwidth (IPv6 OSPF).....	1304
bandwidth.....	1307

clear ipv6 ospf process.....	1308
debug ipv6 ospf events.....	1309
debug ipv6 ospf ifsm.....	1310
debug ipv6 ospf lsa.....	1311
debug ipv6 ospf nsm.....	1312
debug ipv6 ospf packet.....	1313
debug ipv6 ospf route.....	1314
default-information originate.....	1315
default-metric (IPv6 OSPF).....	1317
distance (IPv6 OSPF).....	1318
distribute-list (IPv6 OSPF).....	1320
ipv6 ospf authentication spi.....	1323
ipv6 ospf cost.....	1326
ipv6 ospf dead-interval.....	1328
ipv6 ospf display route single-line.....	1329
ipv6 ospf encryption spi esp.....	1330
ipv6 ospf hello-interval.....	1333
ipv6 ospf neighbor.....	1334
ipv6 ospf network.....	1336
ipv6 ospf priority.....	1337
ipv6 ospf retransmit-interval.....	1338
ipv6 ospf transmit-delay.....	1339
ipv6 router ospf area.....	1340
max-concurrent-dd (IPv6 OSPF).....	1342
passive-interface (IPv6 OSPF).....	1343
redistribute (IPv6 OSPF).....	1344
restart ipv6 ospf graceful.....	1346
router ipv6 ospf.....	1347
router-id (IPv6 OSPF).....	1349
service ospf6.....	1350
show debugging ipv6 ospf.....	1351
show ipv6 ospf.....	1352
show ipv6 ospf database.....	1354
show ipv6 ospf database external.....	1356
show ipv6 ospf database grace.....	1357
show ipv6 ospf database inter-prefix.....	1358
show ipv6 ospf database inter-router.....	1359
show ipv6 ospf database intra-prefix.....	1360
show ipv6 ospf database link.....	1361
show ipv6 ospf database network.....	1362
show ipv6 ospf database router.....	1364
show ipv6 ospf interface.....	1368
show ipv6 ospf neighbor.....	1370
show ipv6 ospf route.....	1372
show ipv6 ospf virtual-links.....	1373
summary-address (IPv6 OSPF).....	1374
timers spf exp (IPv6 OSPF).....	1376
undebg ipv6 ospf events.....	1377
undebg ipv6 ospf ifsm.....	1378
undebg ipv6 ospf lsa.....	1379
undebg ipv6 ospf nsm.....	1380
undebg ipv6 ospf packet.....	1381
undebg ipv6 ospf route.....	1382

Chapter 28: Route Map Commands.....	1383
Introduction.....	1384

match interface.....	1385
match ip address.....	1387
match ip next-hop.....	1389
match ipv6 address.....	1391
match metric.....	1393
match route-type.....	1394
match tag.....	1396
route-map.....	1397
set ip next-hop (route map).....	1399
set metric.....	1400
set metric-type.....	1402
set tag.....	1403
show route-map.....	1404

Chapter 29: Link Health Monitoring for Switches Commands..... 1405

Introduction.....	1406
consecutive probe loss.....	1407
debug linkmon.....	1409
destination (linkmon-probe).....	1411
dscp (linkmon-probe).....	1412
egress interface (linkmon-probe).....	1413
enable (linkmon-probe).....	1414
interval (linkmon-probe).....	1415
ip-version (linkmon-probe).....	1416
jitter.....	1417
latency.....	1419
linkmon probe.....	1421
linkmon probe-history.....	1423
linkmon profile.....	1425
sample-size (linkmon-probe).....	1426
service linkmon.....	1427
show linkmon probe.....	1428
show linkmon probe-history.....	1431
show linkmon trigger.....	1434
size (linkmon-probe).....	1437
source (linkmon-probe).....	1438
url (linkmon-probe).....	1439

PART 4: Multicast Applications..... 1440

Chapter 30: IGMP and IGMP Snooping Commands..... 1441

Introduction.....	1443
clear ip igmp.....	1444
clear ip igmp group.....	1445
clear ip igmp interface.....	1446
debug igmp.....	1447
ip igmp.....	1448
ip igmp access-group.....	1449
ip igmp flood-group.....	1450
ip igmp flood specific-query.....	1452
ip igmp immediate-leave.....	1453
ip igmp last-member-query-count.....	1454
ip igmp last-member-query-interval.....	1455
ip igmp limit.....	1456
ip igmp maximum-groups.....	1458

ip igmp mroute-proxy.....	1460
ip igmp proxy-service.....	1461
ip igmp querier-timeout.....	1463
ip igmp query-holdtime.....	1464
ip igmp query-interval.....	1466
ip igmp query-max-response-time.....	1468
ip igmp ra-option.....	1470
ip igmp robustness-variable.....	1471
ip igmp snooping.....	1472
ip igmp snooping fast-leave.....	1473
ip igmp snooping mrouter.....	1474
ip igmp snooping querier.....	1475
ip igmp snooping report-suppression.....	1476
ip igmp snooping routermode.....	1477
ip igmp snooping source-timeout.....	1479
ip igmp snooping tcn query solicit.....	1480
ip igmp source-address-check.....	1483
ip igmp ssm.....	1484
ip igmp ssm-map enable.....	1485
ip igmp ssm-map static.....	1486
ip igmp static-group.....	1488
ip igmp startup-query-count.....	1490
ip igmp startup-query-interval.....	1491
ip igmp trusted.....	1492
ip igmp version.....	1493
show debugging igmp.....	1494
show ip igmp groups.....	1495
show ip igmp interface.....	1497
show ip igmp proxy.....	1499
show ip igmp proxy groups.....	1500
show ip igmp snooping mrouter.....	1502
show ip igmp snooping routermode.....	1503
show ip igmp snooping source-timeout.....	1504
show ip igmp snooping statistics.....	1505
undebg igmp.....	1507

Chapter 31: MLD and MLD Snooping Commands..... 1508

Introduction.....	1509
clear ipv6 mld.....	1510
clear ipv6 mld group.....	1511
clear ipv6 mld interface.....	1512
debug mld.....	1513
ipv6 mld.....	1514
ipv6 mld access-group.....	1515
ipv6 mld immediate-leave.....	1516
ipv6 mld last-member-query-count.....	1517
ipv6 mld last-member-query-interval.....	1518
ipv6 mld limit.....	1519
ipv6 mld querier-timeout.....	1521
ipv6 mld query-interval.....	1522
ipv6 mld query-max-response-time.....	1523
ipv6 mld robustness-variable.....	1524
ipv6 mld snooping.....	1525
ipv6 mld snooping fast-leave.....	1527
ipv6 mld snooping mrouter.....	1528
ipv6 mld snooping querier.....	1530

ipv6 mld snooping report-suppression.....	1531
ipv6 mld ssm-map enable.....	1533
ipv6 mld ssm-map static.....	1534
ipv6 mld static-group.....	1535
ipv6 mld version.....	1537
show debugging mld.....	1538
show ipv6 mld groups.....	1539
show ipv6 mld interface.....	1541
show ipv6 mld snooping mrouter.....	1542
show ipv6 mld snooping statistics.....	1543

Chapter 32: Multicast Commands..... 1544

Introduction.....	1545
clear ip mroute.....	1546
clear ip mroute statistics.....	1548
clear ip multicast route.....	1549
clear ipv6 mroute.....	1550
clear ipv6 mroute statistics.....	1551
ipv6 multicast forward-slow-path-packet.....	1552
debug nsm.....	1553
debug nsm mcast.....	1554
debug nsm mcast6.....	1555
ip mroute.....	1556
ip multicast allow-register-fragments.....	1558
ip multicast forward-first-packet.....	1559
ip multicast handle-igmp-immediately.....	1560
ip multicast route.....	1561
ip multicast route-limit.....	1564
ip multicast wrong-vif-suppression.....	1565
ip multicast-routing.....	1566
ipv6 mroute.....	1567
ipv6 multicast route.....	1569
ipv6 multicast route-limit.....	1572
ipv6 multicast-routing.....	1573
multicast.....	1574
platform l2mc-overlap.....	1575
platform l2mc-table mode.....	1576
platform multicast-ratelimit.....	1579
platform stop-unreg-mc-flooding.....	1580
show debugging nsm mcast.....	1582
show ip mroute.....	1583
show ip mvif.....	1586
show ip rpf.....	1587
show ipv6 mif.....	1588
show ipv6 mroute.....	1589
show ipv6 multicast forwarding.....	1591

Chapter 33: PIM-SM Commands..... 1592

Introduction.....	1594
clear ip pim sparse-mode bsr rp-set *.....	1595
clear ip pim sparse-mode packet statistics.....	1596
clear ip mroute pim sparse-mode.....	1597
debug pim sparse-mode.....	1598
debug pim sparse-mode timer.....	1599
ip multicast allow-register-fragments.....	1601

ip pim accept-register list.....	1602
ip pim anycast-rp.....	1603
ip pim bsr-border.....	1604
ip pim bsr-candidate.....	1605
ip pim cisco-register-checksum.....	1606
ip pim cisco-register-checksum group-list.....	1607
ip pim crp-cisco-prefix.....	1608
ip pim dr-priority.....	1609
ip pim exclude-genid.....	1610
ip pim ext-srcs-directly-connected.....	1611
ip pim hello-holdtime (PIM-SM).....	1612
ip pim hello-interval (PIM-SM).....	1613
ip pim ignore-rp-set-priority.....	1614
ip pim jp-timer.....	1615
ip pim neighbor-filter (PIM-SM).....	1616
ip pim register-rate-limit.....	1617
ip pim register-rp-reachability.....	1618
ip pim register-source.....	1619
ip pim register-suppression.....	1620
ip pim rp-address.....	1621
ip pim rp-candidate.....	1623
ip pim rp-register-kat.....	1625
ip pim sparse-mode.....	1626
ip pim sparse-mode join-prune-batching.....	1627
ip pim sparse-mode passive.....	1628
ip pim sparse-mode wrong-vif-suppression.....	1629
ip pim spt-threshold.....	1630
ip pim spt-threshold group-list.....	1631
ip pim ssm.....	1632
service pim.....	1634
show debugging pim sparse-mode.....	1635
show ip pim sparse-mode bsr-router.....	1636
show ip pim sparse-mode interface.....	1637
show ip pim sparse-mode interface detail.....	1639
show ip pim sparse-mode local-members.....	1640
show ip pim sparse-mode mroute.....	1642
show ip pim sparse-mode mroute detail.....	1644
show ip pim sparse-mode neighbor.....	1646
show ip pim sparse-mode nexthop.....	1648
show ip pim sparse-mode packet statistics.....	1650
show ip pim sparse-mode rp-hash.....	1651
show ip pim sparse-mode rp mapping.....	1652
undebg all pim sparse-mode.....	1653

Chapter 34: PIM-SMv6 Commands..... 1654

Introduction.....	1656
clear ipv6 mroute pim.....	1657
clear ipv6 mroute pim sparse-mode.....	1658
clear ipv6 pim sparse-mode bsr rp-set *.....	1659
debug ipv6 pim sparse-mode.....	1660
debug ipv6 pim sparse-mode packet.....	1662
debug ipv6 pim sparse-mode timer.....	1663
ipv6 pim accept-register.....	1666
ipv6 pim anycast-rp.....	1667
ipv6 pim bsr-border.....	1669
ipv6 pim bsr-candidate.....	1670

ipv6 pim cisco-register-checksum.....	1671
ipv6 pim cisco-register-checksum group-list.....	1672
ipv6 pim crp-cisco-prefix.....	1673
ipv6 pim dr-priority.....	1674
ipv6 pim exclude-genid.....	1675
ipv6 pim ext-srcs-directly-connected.....	1676
ipv6 pim hello-holdtime.....	1677
ipv6 pim hello-interval.....	1678
ipv6 pim ignore-rp-set-priority.....	1679
ipv6 pim jp-timer.....	1680
ipv6 pim neighbor-filter.....	1681
ipv6 pim register-rate-limit.....	1682
ipv6 pim register-rp-reachability.....	1683
ipv6 pim register-source.....	1684
ipv6 pim register-suppression.....	1686
ipv6 pim rp-address.....	1687
ipv6 pim rp-candidate.....	1690
ipv6 pim rp embedded.....	1692
ipv6 pim rp-register-kat.....	1693
ipv6 pim sparse-mode.....	1694
ipv6 pim sparse-mode passive.....	1695
ipv6 pim spt-threshold.....	1696
ipv6 pim spt-threshold group-list.....	1697
ipv6 pim ssm.....	1698
ipv6 pim unicast-bsm.....	1699
service pim6.....	1700
show debugging ipv6 pim sparse-mode.....	1701
show ipv6 pim sparse-mode bsr-router.....	1702
show ipv6 pim sparse-mode interface.....	1703
show ipv6 pim sparse-mode interface detail.....	1705
show ipv6 pim sparse-mode local-members.....	1706
show ipv6 pim sparse-mode mroute.....	1708
show ipv6 pim sparse-mode mroute detail.....	1710
show ipv6 pim sparse-mode neighbor.....	1712
show ipv6 pim sparse-mode nexthop.....	1713
show ipv6 pim sparse-mode rp-hash.....	1715
show ipv6 pim sparse-mode rp mapping.....	1716
show ipv6 pim sparse-mode rp nexthop.....	1717
undebg all ipv6 pim sparse-mode.....	1719
undebg ipv6 pim sparse-mode.....	1720

Chapter 35: PIM-DM Commands..... 1722

Introduction.....	1723
debug pim dense-mode all.....	1724
debug pim dense-mode context.....	1725
debug pim dense-mode decode.....	1726
debug pim dense-mode encode.....	1727
debug pim dense-mode fsm.....	1728
debug pim dense-mode mrt.....	1729
debug pim dense-mode nexthop.....	1730
debug pim dense-mode nsm.....	1731
debug pim dense-mode vif.....	1732
ip pim dense-mode.....	1733
ip pim dense-mode passive.....	1734
ip pim dense-mode wrong-vif-suppression.....	1735
ip pim ext-srcs-directly-connected.....	1736

ip pim hello-holdtime (PIM-DM).....	1737
ip pim hello-interval (PIM-DM).....	1738
ip pim max-graft-retries.....	1739
ip pim neighbor-filter (PIM-DM).....	1741
ip pim propagation-delay.....	1742
ip pim state-refresh origination-interval.....	1743
service pdm.....	1744
show debugging pim dense-mode.....	1745
show ip pim dense-mode interface.....	1746
show ip pim dense-mode interface detail.....	1748
show ip pim dense-mode mroute.....	1749
show ip pim dense-mode neighbor.....	1750
show ip pim dense-mode neighbor detail.....	1751
show ip pim dense-mode nexthop.....	1752
undebg all pim dense-mode.....	1753

Chapter 36: Multicast Source Discovery Protocol (MSDP) Commands..... 1754

Introduction.....	1755
clear ip msdp sa-cache.....	1756
debug msdp.....	1757
debug msdp timer.....	1758
ip msdp hold-time.....	1759
ip msdp keep-alive.....	1761
ip msdp mesh-group.....	1763
ip msdp mesh-group member.....	1765
ip msdp mesh-group member hold-time.....	1767
ip msdp mesh-group member keep-alive.....	1769
ip msdp peer.....	1771
ip msdp peer hold-time.....	1773
ip msdp peer keep-alive.....	1775
ip msdp peer rp-filter.....	1777
ip msdp peer sg-filter.....	1779
ip msdp sa-cache-timeout.....	1781
msdp default peer.....	1782
show debugging msdp.....	1783
show ip msdp mesh-group.....	1785
show ip msdp peer.....	1789
show ip msdp sa-cache.....	1793

PART 5: Access and Security..... 1795

Chapter 37: IPv4 Hardware Access Control List (ACL) Commands..... 1796

Introduction.....	1797
access-group.....	1800
access-list (numbered hardware ACL for ICMP).....	1803
access-list (numbered hardware ACL for IP packets).....	1808
access-list (numbered hardware ACL for IP protocols).....	1812
access-list (numbered hardware ACL for MAC addresses).....	1818
access-list (numbered hardware ACL for TCP or UDP).....	1822
access-list hardware (named hardware ACL).....	1827
access-list hardware-deny-log.....	1829
acl-group ip address.....	1833
acl-group ip port.....	1834
(acl-group ip port range).....	1835
clear access-list counters.....	1837

commit (IPv4).....	1838
ip (ip-host-group).....	1839
(named hardware ACL entry for ICMP).....	1841
(named hardware ACL entry for IP packets).....	1847
(named hardware ACL entry for IP protocols).....	1853
(named hardware ACL entry for MAC addresses).....	1860
(named hardware ACL entry for TCP or UDP).....	1864
platform acls-to-vlanclassifiers.....	1869
show access-group.....	1871
show access-list (IPv4 Hardware ACLs).....	1872
show access-list counters.....	1874
show acl-group ip address.....	1876
show acl-group ip port.....	1877
show interface access-group.....	1878

Chapter 38: IPv4 Software Access Control List (ACL) Commands..... 1880

Introduction.....	1881
access-list extended (named).....	1883
access-list (extended numbered).....	1892
(access-list extended ICMP filter).....	1895
(access-list extended IP filter).....	1898
(access-list extended IP protocol filter).....	1902
(access-list extended TCP UDP filter).....	1907
access-list standard (named).....	1911
access-list (standard numbered).....	1913
(access-list standard named filter).....	1915
(access-list standard numbered filter).....	1917
clear ip prefix-list.....	1919
dos.....	1920
ip prefix-list.....	1924
maximum-access-list (deleted).....	1926
show access-list (IPv4 Software ACLs).....	1927
show dos interface.....	1929
show ip access-list.....	1932
show ip prefix-list.....	1933
vty access-class (numbered).....	1934

Chapter 39: IPv6 Hardware Access Control List (ACL) Commands..... 1935

Introduction.....	1936
access-list hardware-deny-log.....	1938
acl-group ipv6 address.....	1942
clear access-list counters.....	1943
commit (IPv6).....	1944
ipv6 (ipv6-host-group).....	1945
ipv6 access-list (named IPv6 hardware ACL).....	1947
ipv6 traffic-filter.....	1949
(named IPv6 hardware ACL: ICMP entry).....	1951
(named IPv6 hardware ACL: IPv6 packet entry).....	1957
(named IPv6 hardware ACL: IP protocol entry).....	1962
(named IPv6 hardware ACL: TCP or UDP entry).....	1969
platform acls-to-vlanclassifiers.....	1975
show access-list counters.....	1977
show acl-group ipv6 address.....	1979
show ipv6 access-list (IPv6 Hardware ACLs).....	1980

Chapter 40:	IPv6 Software Access Control List (ACL) Commands.....	1981
	Introduction.....	1982
	ipv6 access-list extended (named).....	1984
	ipv6 access-list extended proto.....	1989
	(ipv6 access-list extended IP protocol filter).....	1994
	(ipv6 access-list extended TCP UDP filter).....	1999
	ipv6 access-list standard (named).....	2002
	(ipv6 access-list standard filter).....	2004
	ipv6 prefix-list.....	2006
	show ipv6 access-list (IPv6 Software ACLs).....	2008
	show ipv6 prefix-list.....	2010
	vtv ipv6 access-class (named).....	2011
Chapter 41:	QoS and Policy-based Routing Commands.....	2012
	Introduction.....	2014
	class.....	2015
	class-map.....	2016
	clear mls qos interface policer-counters.....	2017
	clear mls qos interface queue-counters.....	2018
	default-action.....	2019
	description (QoS policy-map).....	2021
	egress-rate-limit.....	2022
	egress-rate-limit overhead.....	2023
	match access-group.....	2024
	match cos.....	2026
	match dscp.....	2027
	match eth-format protocol.....	2028
	match inner-cos.....	2033
	match inner-tpid.....	2034
	match inner-vlan.....	2035
	match ip-precedence.....	2036
	match mac-type.....	2037
	match tcp-flags.....	2038
	match tpid.....	2039
	match vlan.....	2040
	mls qos aggregate-police action.....	2041
	mls qos aggregate-police counters.....	2043
	mls qos cos.....	2044
	mls qos enable.....	2045
	mls qos map cos-queue.....	2046
	mls qos map premark-dscp.....	2047
	mls qos queue.....	2050
	mls qos queue name.....	2051
	mls qos scheduler-set.....	2052
	mls qos scheduler-set priority-queue.....	2053
	mls qos scheduler-set wrr-queue group.....	2054
	no police.....	2056
	police-aggregate.....	2057
	police counters.....	2058
	police single-rate action.....	2059
	police twin-rate action.....	2061
	policy-map.....	2063
	service-policy input.....	2064
	set bandwidth-class.....	2065

set cos.....	2068
set dscp.....	2070
set ip next-hop (PBR).....	2072
set queue.....	2074
show class-map.....	2076
show mls qos.....	2077
show mls qos aggregate-policer.....	2078
show mls qos interface.....	2079
show mls qos interface policer-counters.....	2082
show mls qos interface queue-counters.....	2084
show mls qos interface storm-status.....	2086
show mls qos maps cos-queue.....	2087
show mls qos maps premark-dscp.....	2088
show mls qos scheduler-set.....	2089
show platform classifier statistics utilization brief.....	2092
show policy-map.....	2097
storm-action.....	2098
storm-downtime.....	2100
storm-protection.....	2101
storm-rate.....	2102
storm-window.....	2103
strict-priority-queue egress-rate-limit queues.....	2104
strict-priority-queue queue-limit.....	2105
trust dscp.....	2106
wrr-queue disable queues.....	2108
wrr-queue egress-rate-limit queues.....	2109
wrr-queue queue-limit.....	2110

Chapter 42: 802.1X Commands.....2112

Introduction.....	2113
dot1x accounting.....	2114
dot1x authentication.....	2115
debug dot1x.....	2116
dot1x control-direction.....	2118
dot1x eap.....	2120
dot1x eapol-version.....	2121
dot1x initialize interface.....	2122
dot1x initialize supplicant.....	2124
dot1x keytransmit.....	2125
dot1x max-auth-fail.....	2126
dot1x max-reauth-req.....	2128
dot1x max-req.....	2130
dot1x port-control.....	2132
dot1x timeout tx-period.....	2134
show debugging dot1x.....	2136
show dot1x.....	2137
show dot1x diagnostics.....	2140
show dot1x interface.....	2142
show dot1x sessionstatistics.....	2144
show dot1x statistics interface.....	2145
show dot1x supplicant.....	2146
show dot1x supplicant interface.....	2149
undebg dot1x.....	2151

Chapter 43: Authentication Commands..... 2152

Introduction.....	2155
auth auth-fail vlan.....	2156
auth critical.....	2159
auth dhcp-framed-ip-lease.....	2160
auth dynamic-acl enable.....	2162
auth dynamic-vlan-creation.....	2164
auth guest-vlan.....	2167
auth guest-vlan forward.....	2170
auth guest-vlan hw-forwarding.....	2172
auth host-mode.....	2173
auth log.....	2176
auth max-suppliant.....	2178
auth max-suppliant tagged-vlan.....	2180
auth max-suppliant untagged-vlan.....	2182
auth multi-vlan-session.....	2184
auth priority.....	2186
auth profile (global).....	2188
auth profile (interface).....	2189
auth reauthentication.....	2190
auth roaming disconnected.....	2191
auth roaming enable.....	2193
auth suppliant-ip.....	2195
auth suppliant-mac.....	2198
auth timeout connect-timeout.....	2203
auth timeout quiet-period.....	2205
auth timeout reauth-period.....	2206
auth timeout server-timeout.....	2208
auth timeout supp-timeout.....	2210
auth vlan-restriction.....	2211
auth two-step enable.....	2213
auth two-step order.....	2216
auth-mac accounting.....	2218
auth-mac authentication.....	2219
auth-mac enable.....	2220
auth-mac method.....	2222
auth-mac password.....	2224
auth-mac reauth-relearning.....	2226
auth-mac static.....	2227
auth-mac username.....	2228
auth-web accounting.....	2229
auth-web authentication.....	2230
auth-web enable.....	2231
auth forward.....	2233
auth-web idle-timeout enable.....	2237
auth-web idle-timeout timeout.....	2238
auth-web max-auth-fail.....	2239
auth-web method.....	2241
auth-web-server blocking-mode.....	2242
auth-web-server dhcp ipaddress.....	2243
auth-web-server dhcp lease.....	2245
auth-web-server dhcp-wpad-option.....	2246
auth-web-server host-name.....	2247
auth-web-server intercept-port.....	2248
auth-web-server ip-conflict-prefer-newer-suppliant.....	2250
auth-web-server ipaddress.....	2251
auth-web-server page language.....	2252
auth-web-server login-url.....	2253

auth-web-server page logo.....	2254
auth-web-server page sub-title.....	2255
auth-web-server page success-message.....	2256
auth-web-server page title.....	2257
auth-web-server page welcome-message.....	2258
auth-web-server ping-poll enable.....	2259
auth-web-server ping-poll failcount.....	2260
auth-web-server ping-poll interval.....	2261
auth-web-server ping-poll reauth-timer-refresh.....	2262
auth-web-server ping-poll timeout.....	2263
auth-web-server ping-poll type.....	2264
auth-web-server port.....	2266
auth-web-server redirect-delay-time.....	2267
auth-web-server redirect-url.....	2268
auth-web-server session-keep.....	2269
auth-web-server ssl.....	2270
auth-web-server ssl intercept-port.....	2271
auth-web-server trustpoint.....	2272
copy proxy-autoconfig-file.....	2274
copy web-auth-https-file.....	2275
description (auth-profile).....	2276
erase proxy-autoconfig-file.....	2277
erase web-auth-https-file.....	2278
show auth.....	2279
show auth diagnostics.....	2281
show auth interface.....	2283
show auth sessionstatistics.....	2285
show auth statistics interface.....	2286
show auth supplicant.....	2287
show auth supplicant interface.....	2290
show auth two-step supplicant brief.....	2291
show auth-web-server.....	2293
show auth-web-server page.....	2294
show proxy-autoconfig-file.....	2295

Chapter 44: AAA Commands..... 2296

Introduction.....	2297
aaa accounting auth-mac.....	2298
aaa accounting auth-web.....	2301
aaa accounting commands.....	2304
aaa accounting dot1x.....	2306
aaa accounting login.....	2309
aaa accounting update.....	2313
aaa authentication auth-mac.....	2315
aaa authentication auth-web.....	2317
aaa authentication dot1x.....	2319
aaa authentication enable default group tacacs+.....	2321
aaa authentication enable default local.....	2324
aaa authentication login.....	2325
aaa authorization commands.....	2328
aaa authorization config-commands.....	2330
aaa group server.....	2331
aaa local authentication attempts logout-time.....	2333
aaa local authentication attempts max-fail.....	2334
aaa local authentication attempts max-fail remote-login-only.....	2336
aaa login fail-delay.....	2337

accounting login.....	2338
authorization commands.....	2339
clear aaa local user lockout.....	2341
debug aaa.....	2342
login authentication.....	2343
proxy-port.....	2344
radius-secure-proxy aaa.....	2345
server (radsecproxy-aaa).....	2346
server mutual-authentication.....	2348
server name-check.....	2349
server trustpoint.....	2350
show aaa local user locked.....	2352
show aaa server group.....	2354
show debugging aaa.....	2355
show radius server group.....	2356
undebg aaa.....	2358

Chapter 45: Lightweight Directory Access Protocol (LDAP) Commands..2359

Introduction.....	2360
authentication (ldap-server).....	2361
base-dn.....	2363
bind authenticate root-dn.....	2365
deadtime (ldap-server).....	2366
debug ldap client.....	2367
group-attribute.....	2369
group-dn.....	2370
host (ldap-server).....	2371
ldap-server.....	2373
login-attribute.....	2375
port (ldap-server).....	2377
retransmit (ldap-server).....	2379
search-filter.....	2380
secure cipher (ldap-server).....	2382
secure mode (ldap-server).....	2384
secure trustpoint (ldap-server).....	2386
server (ldap-group).....	2387
show ldap server group.....	2388
timeout (ldap-server).....	2390

Chapter 46: RADIUS Commands.....2391

Introduction.....	2392
auth-mac-promiscuous.....	2393
auth radius send nas-identifier.....	2394
auth radius send service-type.....	2395
clear radius dynamic-authorization counters.....	2396
deadtime (RADIUS server group).....	2397
debug radius.....	2398
ip radius require-message-authenticator.....	2399
ip radius source-interface.....	2400
radius dynamic-authorization-client.....	2401
radius-server deadtime.....	2403
radius-server host.....	2405
radius-server key.....	2410
radius-server retransmit.....	2412
radius-server timeout.....	2414

server (RADIUS server group).....	2416
show debugging radius.....	2419
show radius.....	2420
show radius dynamic-authorization counters.....	2423
show radius local-server auth-mac-promiscuous.....	2425
show radius statistics.....	2426
undebg radius.....	2427

Chapter 47: Local RADIUS Server Commands..... 2428

Introduction.....	2430
attribute (radsrv-grp).....	2431
authentication.....	2434
client (radsecproxy-srv).....	2435
client mutual-authentication.....	2437
client name-check.....	2438
client trustpoint.....	2439
clear radius local-server statistics.....	2441
copy fdb-radius-users (to file).....	2442
copy local-radius-user-db (from file).....	2444
copy local-radius-user-db (to file).....	2445
crypto pki enroll local (deleted).....	2446
crypto pki enroll local local-radius-all-users (deleted).....	2447
crypto pki enroll local user (deleted).....	2448
crypto pki export local pem (deleted).....	2449
crypto pki export local pkcs12 (deleted).....	2450
crypto pki trustpoint local (deleted).....	2451
debug crypto pki (deleted).....	2452
domain-style.....	2453
egress-vlan-id (radsrv-grp).....	2454
egress-vlan-name (radsrv-grp).....	2456
group (radsrv).....	2458
help radius-attribute.....	2459
nas.....	2461
nas message-authenticator (radsrv).....	2463
radius-secure-proxy local-server.....	2465
radius-server local.....	2466
server auth-port.....	2467
server enable.....	2468
server trustpoint (radsrv).....	2469
show radius local-server group.....	2471
show radius local-server nas.....	2472
show radius local-server statistics.....	2473
show radius local-server trustpoint.....	2475
show radius local-server user.....	2476
user (radsrv).....	2478
vlan (radsrv-grp).....	2481

Chapter 48: Public Key Infrastructure and Crypto Commands.....2482

Introduction.....	2483
crypto key generate rsa.....	2484
crypto key zeroize.....	2485
crypto pki authenticate.....	2486
crypto pki enroll.....	2487
crypto pki enroll user.....	2488
crypto pki export pem.....	2490

crypto pki export pkcs12.....	2491
crypto pki import pem.....	2493
crypto pki import pkcs12.....	2495
crypto pki trustpoint.....	2497
crypto secure-mode.....	2499
crypto secure-mode delete hostkey.....	2500
crypto verify.....	2501
crypto verify bootrom.....	2503
crypto verify signed.....	2505
enrollment (ca-trustpoint).....	2507
fingerprint (ca-trustpoint).....	2509
lifetime.....	2511
no crypto pki certificate.....	2512
rsakeypair (ca-trustpoint).....	2513
show crypto key mypubkey rsa.....	2515
show crypto pki certificates.....	2516
show crypto pki enrollment user.....	2518
show crypto pki trustpoint.....	2519
show hash.....	2521
show secure-mode.....	2522
subject-name (ca-trustpoint).....	2523

Chapter 49: TACACS+ Commands..... 2525

Introduction.....	2526
aaa authorization commands.....	2527
aaa authorization config-commands.....	2529
authorization commands.....	2530
ip tacacs source-interface.....	2532
show tacacs+.....	2534
tacacs-server host.....	2536
tacacs-server key.....	2538
tacacs-server timeout.....	2540

Chapter 50: DHCP Snooping Commands..... 2541

Introduction.....	2543
arp security.....	2544
arp security drop link-local-arps.....	2545
arp security violation.....	2547
clear arp security statistics.....	2549
clear ip dhcp snooping binding.....	2550
clear ip dhcp snooping statistics.....	2551
debug arp security.....	2552
debug ip dhcp snooping.....	2553
ip dhcp snooping.....	2554
ip dhcp snooping agent-option.....	2556
ip dhcp snooping agent-option allow-untrusted.....	2557
ip dhcp snooping agent-option circuit-id vlantriple.....	2558
ip dhcp snooping agent-option remote-id.....	2559
ip dhcp snooping binding.....	2561
ip dhcp snooping database.....	2563
ip dhcp snooping delete-by-client.....	2564
ip dhcp snooping delete-by-linkdown.....	2565
ip dhcp snooping disable-l2-flooding.....	2566
ip dhcp snooping max-bindings.....	2567
ip dhcp snooping subscriber-id.....	2569

ip dhcp snooping trust.....	2570
ip dhcp snooping verify mac-address.....	2571
ip dhcp snooping violation.....	2572
ip source binding.....	2574
service dhcp-snooping.....	2576
show arp security.....	2579
show arp security interface.....	2580
show arp security statistics.....	2582
show debugging arp security.....	2585
show debugging ip dhcp snooping.....	2586
show ip dhcp snooping.....	2587
show ip dhcp snooping acl.....	2588
show ip dhcp snooping agent-option.....	2591
show ip dhcp snooping binding.....	2593
show ip dhcp snooping interface.....	2595
show ip dhcp snooping statistics.....	2597
show ip source binding.....	2600

PART 6: Network Availability..... 2601

Chapter 51: VRRP Commands..... 2602

Introduction.....	2603
advertisement-interval.....	2604
alternate-checksum-mode.....	2606
circuit-failover.....	2607
debug vrrp.....	2610
debug vrrp events.....	2611
debug vrrp packet.....	2612
disable (VRRP).....	2613
enable (VRRP).....	2614
preempt-mode.....	2615
priority.....	2618
router ipv6 vrrp (interface).....	2620
router vrrp (interface).....	2622
service vrrp.....	2624
show debugging vrrp.....	2625
show running-config router ipv6 vrrp.....	2626
show running-config router vrrp.....	2627
show vrrp.....	2628
show vrrp counters.....	2630
show vrrp ipv6.....	2633
show vrrp (session).....	2634
transition-mode.....	2635
undebg vrrp.....	2637
undebg vrrp events.....	2638
undebg vrrp packet.....	2639
virtual-ip.....	2640
virtual-ipv6.....	2642
vrrp vmac.....	2644

Chapter 52: Ethernet Protection Switched Ring (EPSRing™) Commands. 2645

Introduction.....	2646
debug epsr.....	2647
epsr.....	2649
epsr configuration.....	2651

epsr datavlan.....	2652
epsr enhancedrecovery enable.....	2654
epsr flush-type.....	2655
epsr mode master controlvlan primary port.....	2657
epsr mode transit controlvlan.....	2658
epsr priority.....	2659
epsr state.....	2660
epsr topology-change.....	2661
epsr trap.....	2663
show debugging epsr.....	2664
service epsr.....	2665
show epsr.....	2666
show epsr common segments.....	2672
show epsr config-check.....	2673
show epsr <epsr-instance>.....	2674
show epsr <epsr-instance> counters.....	2675
show epsr counters.....	2676
show epsr summary.....	2677
undebg epsr.....	2678

Chapter 53: G.8032 Ethernet Ring Protection Switching Commands.....2679

Introduction.....	2680
cfm-sf-notify.....	2681
clear g8032 erp-instance.....	2683
clear g8032 erp-instance statistics.....	2685
data-traffic.....	2686
debug g8032.....	2688
enable (g8032-profile).....	2689
epsr topology-change.....	2690
erp-instance.....	2692
g8032 erp-instance.....	2694
g8032 forced-switch erp-instance.....	2696
g8032 manual-switch erp-instance.....	2698
g8032 physical-ring.....	2700
g8032 profile.....	2702
level (g8032-switch).....	2703
physical-ring.....	2704
profile name.....	2705
raps-channel.....	2706
service onm.....	2707
rpl role.....	2708
show debugging g8032.....	2710
show g8032 erp-instance.....	2711
show g8032 erp-instance statistics.....	2716
show g8032 physical-ring.....	2719
show g8032 profile.....	2721
sub-ring.....	2723
timer (g8032-profile).....	2725
topology-change.....	2727
trap (g8032-switch).....	2729
undebg g8032.....	2730

PART 7: Network Management..... 2731

Chapter 54: AMF and AMF Plus Commands.....2732

Introduction.....	2736
application-proxy ip-filter.....	2737
application-proxy quarantine-vlan.....	2738
application-proxy redirect-url.....	2739
application-proxy threat-protection.....	2740
application-proxy threat-protection send-summary.....	2742
application-proxy whitelist advertised-address.....	2743
application-proxy whitelist enable.....	2744
application-proxy whitelist protection tls.....	2746
application-proxy whitelist server.....	2747
application-proxy whitelist trustpoint (deprecated).....	2749
area-link.....	2750
atmf-arealink.....	2752
atmf-link.....	2754
atmf amfplus-license-only.....	2756
atmf area.....	2758
atmf area password.....	2760
atmf authorize.....	2762
atmf authorize provision.....	2764
atmf backup.....	2766
atmf backup area-masters delete.....	2768
atmf backup area-masters enable.....	2769
atmf backup area-masters now.....	2770
atmf backup area-masters synchronize.....	2771
atmf backup bandwidth.....	2772
atmf backup delete.....	2773
atmf backup enable.....	2774
atmf backup guests delete.....	2775
atmf backup guests enable.....	2776
atmf backup guests now.....	2777
atmf backup guests synchronize.....	2778
atmf backup now.....	2779
atmf backup redundancy enable.....	2781
atmf backup server.....	2782
atmf backup stop.....	2784
atmf backup synchronize.....	2785
atmf cleanup.....	2786
atmf container.....	2787
atmf container login.....	2789
atmf controller.....	2790
atmf distribute firmware.....	2791
atmf domain vlan.....	2793
atmf enable.....	2796
atmf group (membership).....	2797
atmf guest-class.....	2799
atmf log-verbose.....	2801
atmf management subnet.....	2802
atmf management vlan.....	2805
atmf master.....	2808
atmf mtu.....	2809
atmf network-name.....	2810
atmf provision (interface).....	2811
atmf provision node.....	2812
atmf reboot-rolling.....	2814
atmf recover.....	2818
atmf recover guest.....	2820
atmf recover led-off.....	2821

atmf recover over-eth.....	2822
atmf recovery-server.....	2823
atmf remote-login.....	2825
atmf restricted-login.....	2827
atmf retry guest-link.....	2829
atmf secure-mode.....	2830
atmf secure-mode certificate expire.....	2832
atmf secure-mode certificate expiry.....	2833
atmf secure-mode certificate renew.....	2834
atmf secure-mode enable-all.....	2835
atmf select-area.....	2837
atmf topology-gui enable.....	2838
atmf trustpoint.....	2840
atmf virtual-crosslink.....	2842
atmf virtual-link.....	2844
atmf virtual-link description.....	2848
atmf virtual-link protection.....	2849
atmf working-set.....	2851
bridge-group (amf-container).....	2854
clear application-proxy threat-protection.....	2856
clear atmf links.....	2857
clear atmf links virtual.....	2858
clear atmf links statistics.....	2859
clear atmf recovery-file.....	2860
clear atmf secure-mode certificates.....	2861
clear atmf secure-mode statistics.....	2862
clone (amf-provision).....	2863
configure boot config (amf-provision).....	2866
configure boot system (amf-provision).....	2868
copy (amf-provision).....	2870
create (amf-provision).....	2872
debug atmf.....	2875
debug atmf packet.....	2877
delete (amf-provision).....	2880
discovery.....	2882
description (amf-container).....	2884
erase factory-default.....	2885
firmware-url.....	2886
http-enable.....	2888
identity (amf-provision).....	2890
license-cert (amf-provision).....	2893
locate (amf-provision).....	2895
log event-host.....	2897
login-fallback enable.....	2898
modeltype.....	2899
service atmf-application-proxy.....	2900
show application-proxy threat-protection.....	2901
show application-proxy whitelist advertised-address.....	2903
show application-proxy whitelist interface.....	2904
show application-proxy whitelist server.....	2906
show application-proxy whitelist supplicant.....	2907
show atmf.....	2909
show atmf area.....	2913
show atmf area guests.....	2917
show atmf area guests-detail.....	2919
show atmf area nodes.....	2922
show atmf area nodes-detail.....	2924

show atmf area summary.....	2926
show atmf authorization.....	2927
show atmf backup.....	2930
show atmf backup area.....	2935
show atmf backup guest.....	2937
show atmf container.....	2940
show atmf detail.....	2944
show atmf group.....	2947
show atmf group members.....	2949
show atmf guests.....	2951
show atmf guests detail.....	2953
show atmf links.....	2956
show atmf links detail.....	2958
show atmf links guest.....	2966
show atmf links guest detail.....	2968
show atmf links statistics.....	2972
show atmf nodes.....	2975
show atmf provision nodes.....	2977
show atmf recovery-file.....	2979
show atmf secure-mode.....	2980
show atmf secure-mode audit.....	2983
show atmf secure-mode audit link.....	2984
show atmf secure-mode certificates.....	2985
show atmf secure-mode sa.....	2988
show atmf secure-mode statistics.....	2991
show atmf tech.....	2993
show atmf virtual-links.....	2997
show atmf working-set.....	2999
show debugging atmf.....	3000
show debugging atmf packet.....	3001
show running-config atmf.....	3002
state.....	3003
switchport atmf-agentlink.....	3005
switchport atmf-arealink.....	3007
switchport atmf-crosslink.....	3009
switchport atmf-guestlink.....	3011
switchport atmf-link.....	3013
type atmf guest.....	3014
type atmf node.....	3015
undebug atmf.....	3018
username (atmf-guest).....	3019

Chapter 55: STOAT Commands.....3020

Introduction.....	3021
clear stoat collector session counters.....	3022
description (stoat-dest).....	3023
key (stoat-dest).....	3024
name-check (stoat-dest).....	3025
service stoat.....	3026
show stoat collector.....	3027
show stoat destinations.....	3030
shutdown (stoat-dest).....	3032
stoat collector enable.....	3033
stoat collector expiry-period.....	3034
stoat collector key.....	3035
stoat collector trustpoint.....	3037

stoat destination.....	3038
stoat discovery.....	3040
trustpoint (stoat-dest).....	3042
unique-id.....	3043

Chapter 56: Management Stacking Commands..... 3044

Introduction.....	3045
mstack command-node.....	3046
mstack enable.....	3047
mstack remote-login.....	3048
show mstack nodes.....	3050
switchport mstack-link.....	3051

Chapter 57: Dynamic Host Configuration Protocol (DHCP) Commands.... 3052

Introduction.....	3054
bootfile.....	3055
clear ip dhcp binding.....	3056
default-router.....	3057
dns-server.....	3058
domain-name.....	3060
host (DHCP).....	3061
host client-id.....	3062
ip address dhcp.....	3064
ip dhcp bootp ignore.....	3066
ip dhcp globally-authoritative.....	3067
ip dhcp leasequery enable.....	3068
ip dhcp option.....	3069
ip dhcp pool.....	3072
ip dhcp-client default-route distance.....	3073
ip dhcp-client request vendor-identifying-specific.....	3075
ip dhcp-client vendor-identifying-class.....	3076
ip dhcp-relay agent-option.....	3077
ip dhcp-relay agent-option checking.....	3079
ip dhcp-relay agent-option remote-id.....	3080
ip dhcp-relay agent-option subscriber-id.....	3082
ip dhcp-relay information policy.....	3084
ip dhcp-relay maxhops.....	3086
ip dhcp-relay max-message-length.....	3087
ip dhcp-relay server-address.....	3089
ip dhcp-relay short-lease.....	3091
ip dhcp-relay use-client-side-address.....	3092
ip dhcp-relay use-dhcp-relay-ip.....	3094
ip dhcp use-subscriber-id.....	3095
lease.....	3097
network (DHCP).....	3099
next-server.....	3100
option.....	3101
probe enable.....	3103
probe packets.....	3104
probe timeout.....	3105
probe type.....	3106
range.....	3107
route.....	3108
service dhcp-relay.....	3109
service dhcp-server.....	3110

short-lease-threshold.....	3111
show counter dhcp-client.....	3113
show counter dhcp-relay.....	3115
show counter dhcp-server.....	3119
show dhcp lease.....	3121
show ip dhcp binding.....	3122
show ip dhcp pool.....	3124
show ip dhcp-relay.....	3128
show ip dhcp server statistics.....	3129
show ip dhcp server summary.....	3132
subnet-mask.....	3133
use-subscriber-id.....	3134

Chapter 58: DHCP for IPv6 (DHCPv6) Commands..... 3136

Introduction.....	3138
address prefix.....	3139
address range.....	3141
clear counter ipv6 dhcp-client.....	3143
clear counter ipv6 dhcp-server.....	3144
clear ipv6 dhcp binding.....	3145
clear ipv6 dhcp client.....	3147
dns-server (DHCPv6).....	3148
domain-name (DHCPv6).....	3150
ip dhcp-relay agent-option.....	3151
ip dhcp-relay agent-option subscriber-id-auto-mac.....	3153
ip dhcp-relay agent-option checking.....	3154
ip dhcp-relay agent-option remote-id.....	3155
ip dhcp-relay information policy.....	3157
ip dhcp-relay maxhops.....	3159
ip dhcp-relay max-message-length.....	3160
ip dhcp-relay server-address.....	3162
ip dhcp-relay short-lease-ipv6.....	3164
ipv6 address (DHCPv6 PD).....	3166
ipv6 address dhcp.....	3168
ipv6 dhcp client pd.....	3170
ipv6 dhcp option.....	3172
ipv6 dhcp pool.....	3175
ipv6 dhcp server.....	3177
ipv6 local pool.....	3179
ipv6 nd prefix (DHCPv6).....	3181
link-address.....	3184
option (DHCPv6).....	3186
prefix-delegation pool.....	3189
service dhcp-relay.....	3191
show counter dhcp-relay.....	3192
show counter ipv6 dhcp-client.....	3196
show counter ipv6 dhcp-server.....	3198
show ip dhcp-relay.....	3201
show ipv6 dhcp.....	3202
show ipv6 dhcp binding.....	3203
show ipv6 dhcp interface.....	3207
show ipv6 dhcp pool.....	3209
sntp address.....	3211

Chapter 59: NTP Commands..... 3212

Introduction.....	3213
ntp authentication-key.....	3214
ntp broadcastdelay.....	3216
ntp master.....	3217
ntp peer.....	3218
ntp rate-limit.....	3220
ntp restrict.....	3221
ntp server.....	3223
ntp source.....	3225
show ntp associations.....	3227
show ntp counters.....	3230
show ntp counters associations.....	3231
show ntp status.....	3232

Chapter 60: SNMP Commands..... 3233

Introduction.....	3235
alias (interface).....	3236
clear mac address-table notification mac-change.....	3237
debug snmp.....	3238
mac address-table notification mac-change.....	3240
mac address-table notification mac-change history-size.....	3241
mac address-table notification mac-change interval.....	3242
mac address-table notification mac-threshold.....	3243
show counter snmp-server.....	3245
show debugging snmp.....	3250
show mac address-table notification mac-change.....	3251
show running-config snmp.....	3254
show snmp-server.....	3255
show snmp-server community.....	3256
show snmp-server group.....	3257
show snmp-server trap.....	3258
show snmp-server user.....	3259
show snmp-server view.....	3260
snmp trap link-status.....	3261
snmp trap link-status suppress.....	3263
snmp trap mac-change.....	3265
snmp-server.....	3267
snmp-server community.....	3269
snmp-server contact.....	3271
snmp-server enable trap.....	3272
snmp-server engineID local.....	3277
snmp-server engineID local reset.....	3279
snmp-server group.....	3280
snmp-server host.....	3282
snmp-server legacy-ifadminstatus.....	3285
snmp-server location.....	3286
snmp-server source-interface.....	3287
snmp-server startup-trap-delay.....	3288
snmp-server system-name.....	3289
snmp-server user.....	3290
snmp-server view.....	3293
test snmp trap snmp.....	3294
undebg snmp.....	3295

Chapter 61: LLDP Commands..... 3296

Introduction.....	3297
clear lldp statistics.....	3298
clear lldp table.....	3299
debug lldp.....	3300
lldp faststart-count.....	3302
lldp holdtime-multiplier.....	3303
lldp management-address.....	3304
lldp med-notifications.....	3306
lldp med-tlv-select.....	3307
lldp non-strict-med-tlv-order-check.....	3311
lldp notification-interval.....	3312
lldp notifications.....	3313
lldp port-number-type.....	3314
lldp reinit.....	3316
lldp run.....	3317
lldp timer.....	3318
lldp tlv-select.....	3319
lldp transmit receive.....	3321
lldp tx-delay.....	3323
location civic-location configuration.....	3324
location civic-location identifier.....	3329
location civic-location-id.....	3330
location coord-location configuration.....	3332
location coord-location identifier.....	3335
location coord-location-id.....	3337
location elin-location.....	3339
location elin-location-id.....	3340
show debugging lldp.....	3342
show lldp.....	3344
show lldp interface.....	3347
show lldp local-info.....	3350
show lldp neighbors.....	3356
show lldp neighbors detail.....	3358
show lldp statistics.....	3362
show lldp statistics interface.....	3365
show location.....	3368

Chapter 62: Mail (SMTP) Commands..... 3371

Introduction.....	3372
debug mail.....	3373
delete mail.....	3374
mail.....	3375
mail from.....	3377
mail smtpserver.....	3378
mail smtpserver authentication.....	3379
mail smtpserver port.....	3381
mail smtpserver tls.....	3383
show counter mail.....	3385
show mail.....	3386
undebg mail.....	3387

Chapter 63: RMON Commands..... 3388

Introduction.....	3389
rmon alarm.....	3390
rmon collection history.....	3395

rmon collection stats.....	3397
rmon event.....	3398
show rmon alarm.....	3399
show rmon event.....	3400
show rmon history.....	3401
show rmon statistics.....	3403

Chapter 64: Secure Shell (SSH) Commands..... 3404

Introduction.....	3406
banner login (SSH).....	3407
clear ssh.....	3408
crypto key destroy hostkey.....	3409
crypto key destroy userkey.....	3410
crypto key generate hostkey.....	3411
crypto key generate userkey.....	3413
crypto key pubkey-chain knownhosts.....	3415
crypto key pubkey-chain userkey.....	3417
debug ssh client.....	3419
debug ssh server.....	3420
service ssh.....	3421
show banner login.....	3423
show crypto key hostkey.....	3424
show crypto key pubkey-chain knownhosts.....	3426
show crypto key pubkey-chain userkey.....	3428
show crypto key userkey.....	3430
show running-config ssh.....	3432
show ssh.....	3434
show ssh client.....	3437
show ssh server.....	3438
show ssh server allow-users.....	3441
show ssh server deny-users.....	3442
ssh.....	3443
ssh client.....	3446
ssh client allow-legacy-ssh-rsa.....	3449
ssh server.....	3450
ssh server allow-legacy-ssh-rsa.....	3452
ssh server allow-users.....	3453
ssh server authentication.....	3455
ssh server deny-users.....	3457
ssh server disallow-cbc-ciphers.....	3459
ssh server max-auth-tries.....	3460
ssh server resolve-host.....	3461
ssh server scp.....	3462
ssh server secure-algs.....	3463
ssh server secure-ciphers.....	3464
ssh server secure-hostkey.....	3465
ssh server secure-kex.....	3466
ssh server secure-mac.....	3468
ssh server sftp.....	3469
ssh server tcpforwarding.....	3470
undebg ssh client.....	3471
undebg ssh server.....	3472

Chapter 65: Trigger Commands..... 3473

Introduction.....	3474

active (trigger).....	3475
day.....	3476
debug trigger.....	3478
description (trigger).....	3479
repeat.....	3480
script.....	3482
show debugging trigger.....	3484
show running-config trigger.....	3485
show trigger.....	3486
test.....	3491
time (trigger).....	3492
trap.....	3494
trigger.....	3495
trigger activate.....	3496
type atmf guest.....	3497
type atmf node.....	3498
type cpu.....	3501
type env-sensor.....	3503
type interface.....	3506
type linkmon-probe.....	3507
type log.....	3509
type main-pse.....	3510
type memory.....	3511
type periodic.....	3512
type ping-poll.....	3513
type pse-port.....	3514
type reboot.....	3515
type time.....	3516
type usb.....	3517
undebg trigger.....	3518

Chapter 66: Ping-Polling Commands.....3519

Introduction.....	3520
active (ping-polling).....	3521
clear ping-poll.....	3522
critical-interval.....	3523
debug ping-poll.....	3524
description (ping-polling).....	3525
fail-count.....	3526
ip (ping-polling).....	3528
length (ping-poll data).....	3529
normal-interval.....	3530
ping-poll.....	3531
sample-size.....	3532
show counter ping-poll.....	3534
show ping-poll.....	3537
source-ip.....	3541
timeout (ping polling).....	3543
up-count.....	3544
undebg ping-poll.....	3545

Chapter 67: sFlow Commands..... 3546

Introduction.....	3547
debug sflow.....	3548
debug sflow agent.....	3549

sflow agent.....	3550
sflow collector.....	3552
sflow collector id.....	3553
sflow collector max-datagram-size.....	3555
sflow enable.....	3556
sflow max-header-size.....	3557
sflow polling-interval.....	3559
sflow sampling-rate.....	3560
show debugging sflow.....	3561
show running-config sflow.....	3563
show sflow.....	3564
show sflow interface.....	3566
undebg sflow.....	3567

Part 1: Setup and Troubleshooting

1

CLI Navigation Commands

- Contents**
- **Introduction** on page 48
 - **configure terminal** on page 49
 - **disable (Privileged Exec mode)** on page 50
 - **do** on page 51
 - **enable (Privileged Exec mode)** on page 52
 - **end** on page 54
 - **exit** on page 55
 - **help** on page 56
 - **logout** on page 57
 - **show history** on page 58

Introduction

Overview This chapter provides an alphabetical reference for the commands used to navigate between different modes. This chapter also provides a reference for the help and show commands used to help navigate within the CLI.

configure terminal

Overview This command enters the Global Configuration command mode.

Syntax `configure terminal`

Mode Privileged Exec

Example To enter the Global Configuration command mode (note the change in the command prompt), enter the command:

```
awplus# configure terminal
awplus(config)#
```

disable (Privileged Exec mode)

Overview This command exits the Privileged Exec mode, returning the prompt to the User Exec mode. To end a session, use the **exit** command.

Syntax disable

Mode Privileged Exec

Example To exit the Privileged Exec mode, enter the command:

```
awplus# disable  
awplus>
```

Related commands **enable (Privileged Exec mode)**
end
exit

do

Overview This command lets you to run User Exec and Privileged Exec mode commands when you are in any configuration mode.

Syntax do <command>

Parameter	Description
<command>	Specify the command and its parameters.

Mode Any configuration mode

Example awplus# configure terminal
awplus(config)# do ping 192.0.2.23

enable (Privileged Exec mode)

Overview This command enters the Privileged Exec mode and optionally changes the privilege level for a session. If a privilege level is not specified then the maximum privilege level (15) is applied to the session. If the optional privilege level is omitted then only users with the maximum privilege level can access Privileged Exec mode without providing the password as specified by the **enable password** or **enable secret (deprecated)** commands. If no password is specified then only users with the maximum privilege level set with the **username** command can access Privileged Exec mode.

Syntax `enable [<privilege-level>]`

Parameter	Description
<code><privilege-level></code>	Specify the privilege level for a CLI session in the range <1-15>, where 15 is the maximum privilege level, 7 is the intermediate privilege level and 1 is the minimum privilege level. The privilege level for a user must match or exceed the privilege level set for the CLI session for the user to access Privileged Exec mode. Privilege level for a user is configured by username .

Mode User Exec

Usage notes Many commands are available from the Privileged Exec mode that configure operating parameters for the device, so you should apply password protection to the Privileged Exec mode to prevent unauthorized use. Passwords can be encrypted but then cannot be recovered. Note that non-encrypted passwords are shown in plain text in configurations.

The **username** command sets the privilege level for the user. After login, users are given access to privilege level 1. Users access higher privilege levels with the **enable (Privileged Exec mode)** command. If the privilege level specified is higher than the users configured privilege level specified by the **username** command, then the user is prompted for the password for that level.

Note that a separate password can be configured for each privilege level using the **enable password** and the **enable secret (deprecated)** commands from the Global Configuration mode. The **service password-encryption** command encrypts passwords configured by the **enable password** and the **enable secret (deprecated)** commands, so passwords are not shown in plain text in configurations.

Example The following example shows the use of the **enable** command to enter the Privileged Exec mode (note the change in the command prompt).

```
awplus> enable
awplus#
```

The following example shows the **enable** command enabling access the Privileged Exec mode for users with a privilege level of 7 or greater. Users with a privilege level of 7 or greater do not need to enter a password to access Privileged Exec mode. Users with a privilege level 6 or less need to enter a password to access Privilege Exec mode. Use the **enable password** command or the **enable secret (deprecated)** commands to set the password to enable access to Privileged Exec mode.

```
awplus> enable 7
awplus#
```

Related commands

- disable (Privileged Exec mode)**
- enable password**
- enable secret (deprecated)**
- exit**
- service password-encryption**
- username**

end

Overview This command returns the prompt to the Privileged Exec command mode, from any advanced command mode.

Syntax end

Mode All advanced command modes, including Global Configuration and Interface Configuration modes.

Example The following example shows how to use the **end** command to return to the Privileged Exec mode directly from Interface Configuration mode.

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# end
awplus#
```

Related commands **disable (Privileged Exec mode)**
enable (Privileged Exec mode)
exit

exit

Overview This command exits the current mode, and returns the prompt to the mode at the previous level. When used in User Exec mode, the **exit** command terminates the session.

Syntax exit

Mode All command modes, including Interface Configuration and Global Configuration modes.

Example The following example shows the use of the **exit** command to exit Interface Configuration mode and return to Global Configuration mode.

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# exit
awplus(config)#
```

Related commands **disable (Privileged Exec mode)**
enable (Privileged Exec mode)
end

help

Overview This command displays a description of the AlliedWare Plus™ OS help system.

Syntax `help`

Mode All command modes

Example To display a description on how to use the system help, use the command:
`awplus# help`

Output The following shows typical output.

Example output from the `help` command

```
When you need help at the command line, press '?'.

If nothing matches, the help list will be empty. Delete
characters until entering a '?' shows the available options.

Enter '?' after a complete parameter to show remaining valid
command parameters (e.g. 'show ?').

Enter '?' after part of a parameter to show parameters that
complete the typed letters (e.g. 'show ip?').
```

logout

Overview This command exits the User Exec or Privileged Exec modes and ends the session.

Syntax logout

Mode User Exec and Privileged Exec

Example To exit the User Exec mode, use the command:
awplus# logout

show history

Overview This command lists the commands entered in the current session. The history buffer is cleared automatically upon reboot.

The output lists all command line entries, including commands that returned an error.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show history

Mode User Exec and Privileged Exec

Example To display the commands entered during the current session, use the command:

```
awplus# show history
```

Output The following shows typical output.

Example output from the show history command

```
1 en
2 show ru
3 conf t
4 route-map er deny 3
5 exit
6 ex
7 di
```

2

Device GUI and Vista Manager EX Commands

- Contents**
- **Introduction** on page 60
 - **atmf topology-gui enable** on page 61
 - **http check-api-content-type-header** on page 63
 - **http log webapi-requests** on page 64
 - **http port** on page 65
 - **http secure-port** on page 67
 - **http tls-version-minimum** on page 69
 - **http trustpoint** on page 70
 - **log event-host** on page 72
 - **service http** on page 73
 - **show http** on page 74

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure the Device GUI. They also allow your device to be monitored and managed by Vista Manager EX™.

For more information, see [Getting Started with the Device GUI on Switches](#).

atmf topology-gui enable

Overview Use this command to enable the operation of Vista Manager EX on the Master device.

Vista Manager EX delivers state-of-the-art monitoring and management for your Autonomous Management Framework™ (AMF) network, by automatically creating a complete topology map of switches, firewalls and wireless access points (APs). An expanded view includes third-party devices such as security cameras.

Use the **no** variant of this command to disable operation of Vista Manager EX.

Syntax atmf topology-gui enable
no atmf topology-gui enable

Default Disabled by default on AMF Master and member nodes. Enabled by default on Controllers.

Mode Global Configuration mode

Usage notes To use Vista Manager EX, you must also enable the HTTP service on all AMF nodes, including all AMF masters and controllers. The HTTP service is enabled by default on AlliedWare Plus switches and disabled by default on AR-Series firewalls. To enable it, use the commands:

```
Node1# configure terminal
Node1(config)# service http
```

On one master in each AMF area in your network, you also need to configure the master to send event notifications to Vista Manager EX. To do this, use the commands:

```
Node1# configure terminal
Node1(config)# log event-host <ip-address> atmf-topology-event
```

Examples To enable Vista Manager EX on Node1, use the commands:

```
Node1# configure terminal
Node1(config)# atmf topology-gui enable
```

To disable Vista Manager EX on Node1, use the commands:

```
Node1# configure terminal
Node1(config)# no atmf topology-gui enable
```

Related **atmf enable**
commands **log event-host**
service http

http check-api-content-type-header

Overview Use this command to make sure that all the web-based Device GUI HTTP/S requests coming into the device have the expected Content-Type HTTP header set to 'application/json'. This makes the device's HTTP request processing more secure.

Do not use this command if you use Vista Manager EX. Some of its requests use different header settings, and this command will cause the device to drop those requests.

Use the **no** variant of this command to disable this check.

Syntax http check-api-content-type-header
no http check-api-content-type-header

Default Disabled

Mode Global Configuration

Usage notes We recommend you enable the HTTP header checking, unless you are using Vista Manager EX.

Note that it requires GUI version 2.19.0 or later.

Example To check the validity of device GUI HTTP requests, use the commands:

```
awplus# configure terminal  
awplus(config)# http check-api-content-type-header
```

To disable the check again, use the commands:

```
awplus# configure terminal  
awplus(config)# no http check-api-content-type-header
```

Related commands [show http](#)

Command changes Version 5.5.4-2.1: command added

http log webapi-requests

Overview Use this command to log authenticated web API requests. These logs allow you to monitor and debug Vista Manager EX or Device GUI interactions with your device.

See the [Logging Feature Overview and Configuration Guide](#) for more information about the different types of logging and how to filter log messages.

Use the **no** variant of this command to disable authenticated web API request logging.

Syntax `http log webapi-requests {configuration|all}`
`no http log webapi-requests`

Parameter	Description
configuration	Log PUT, POST, and DELETE requests.
all	Log PUT, POST, DELETE, and GET requests.

Default Web API request logging is disabled.

Mode Global Configuration

Example To enable logging of all authenticated web API requests, use the following commands:

```
awplus# configure terminal
awplus(config)# http log webapi-requests all
```

To disable logging of authenticated web API requests, use the following commands:

```
awplus# configure terminal
awplus(config)# no http log webapi-requests
```

Related commands [http port](#)
[service http](#)
[show log](#)

Command changes Version 5.4.8-1.1: command added

http port

Overview Use this command to change the HTTP port used to access the web-based device GUI, or to disable HTTP management.

Use the **no** variant of this command to return to using the default port, which is 80.

Syntax http port {<1-65535>|none}

no http port

Parameter	Description
<1-65535>	The HTTP port number
none	Disable HTTP management. You may want to do this if you need to use port 80 for a different service or you do not need to use HTTP at all.

Default The default port for accessing the GUI is port 80.

Mode Global Configuration

Usage notes Do not configure the HTTP port to be the same as the HTTPS port.

Note that the device will redirect from HTTP to HTTPS unless you have disabled HTTPS access, which we do not recommend doing.

Example To set the port to 8080, use the commands:

```
awplus# configure terminal
awplus(config)# http port 8080
```

To return to using the default port of 80, use the commands:

```
awplus# configure terminal
awplus(config)# no http port
```

To stop users from accessing the GUI via HTTP, use the commands:

```
awplus# configure terminal
awplus(config)# http port none
```

Related commands [http secure-port](#)
[service http](#)
[show http](#)

Command changes Version 5.4.7-2.4: command added on AR-Series devices
Version 5.4.8-0.2: command added on AlliedWare Plus switches

http secure-port

Overview Use this command to change the HTTPS port used to access the web-based device GUI, or to disable HTTPS management.

Use the **no** variant of this command to return to using the default port, which is 443.

Syntax http secure-port {<1-65535>|none}
no http secure-port

Parameter	Description
<1-65535>	The HTTPS port number
none	Disable HTTPS management. Do not do this if you want to use Vista Manager EX or the GUI.

Default The default port for accessing the GUI is port 443.

Mode Global Configuration

Usage notes Do not configure the HTTPS port to be the same as the HTTP port.
Note that if you are using Vista Manager EX and need to change the HTTPS port, you must use certificate-based authorization in Vista Manager EX. See the [Vista Manager EX Installation Guide](#) for instructions.

Example To set the port to 8443, use the commands:

```
awplus# configure terminal
awplus(config)# http secure-port 8443
```

To return to using the default port of 443, use the commands:

```
awplus# configure terminal
awplus(config)# no http secure-port
```

To stop users from accessing the GUI via HTTPS, use the commands:

```
awplus# configure terminal
awplus(config)# http secure-port none
```

Related commands [http port](#)
[service http](#)
[show http](#)

Command changes Version 5.4.7-1.1: command added on AR-Series devices
Version 5.4.7-2.4: **none** parameter added
Version 5.4.8-0.2: command added on AlliedWare Plus switches

http tls-version-minimum

Overview Use this command to set the minimum TLS version the device will use for all HTTP services running on the device. This includes the web-based GUI and RESTCONF.

Use the **no** variant of this command to return to the default minimum TLS version.

Syntax `http tls-version-minimum {1.2|1.3}`
`no http tls-version-minimum`

Parameter	Description
1.2	Use a minimum of TLS 1.2.
1.3	Use a minimum of TLS 1.3.

Default 1.2

Mode Global Configuration

Example To use a minimum of TLS 1.3, use the commands:

```
awplus# configure terminal
awplus(config)# http tls-version-minimum 1.3
```

To return to using a minimum of TLS 1.2, use the commands:

```
awplus# configure terminal
awplus(config)# no http tls-version-minimum
```

Related commands [show http](#)

Command changes Version 5.5.5-1.1: command added

http trustpoint

Overview Use this command to set the PKI trustpoint to use for secure HTTP communication to an AlliedWare Plus device.

Use the **no** variant of this command to revert to using the default trustpoint 'default-selfsigned'.

Syntax http trustpoint <trustpoint-name>
no http trustpoint

Parameter	Description
<trustpoint-name>	Name of trustpoint

Default By default, HTTP uses the 'default-selfsigned' trustpoint.

Mode Global Configuration

Usage notes Before using the **http trustpoint** command you will need to establish a trustpoint. For example, you can create a local self-signed trustpoint using the procedure outlined below.

Create a self-signed trustpoint called 'vista' with keypair 'vista_key':

```
awplus# configure terminal
awplus(config)# crypto pki trustpoint vista
awplus(ca-trustpoint)# enrollment selfsigned
awplus(ca-trustpoint)# rsakeypair vista_key
awplus(ca-trustpoint)# exit
awplus(config)# exit
```

Create the root and server certificates for this trustpoint:

```
awplus# crypto pki authenticate vista
awplus# crypto pki enroll vista
```

For more information about the AlliedWare Plus implementation of Public Key Infrastructure (PKI), see the [Public Key Infrastructure \(PKI\) Feature Overview and Configuration Guide](#)

Example To configure HTTP to use the trustpoint 'vista', use the commands:

```
awplus# configure terminal
awplus(config)# http trustpoint vista
```

To configure HTTP to use the default trustpoint 'default-selfsigned', use the commands:

```
awplus# configure terminal  
awplus(config)# no http trustpoint
```

Related commands

- crypto pki trustpoint**
- show crypto pki certificates**
- show crypto pki trustpoint**

Command changes Version 5.5.1-2.1: command added

log event-host

Overview Use this command to set up an external host to log AMF topology events through Vista Manager. This command is run on the Master device.

Use the **no** variant of this command to disable log events through Vista Manager.

Syntax log event-host [<ipv4-addr>|<ipv6-addr>] atmf-topology-event
no log event-host [<ipv4-addr>|<ipv6-addr>] atmf-topology-event

Parameter	Description
<ipv4-addr>	ipv4 address of the event host
<ipv6-addr>	ipv6 address of the event host

Default Log events are disabled by default.

Mode Global Configuration

Usage notes Event hosts are set so syslog sends the messages out as they come.
Note that there is a difference between log event and log host messages:

- Log event messages are sent out as they come by syslog
- Log host messages are set to wait for a number of messages (20) to send them out together for traffic optimization.

Example To enable Node 1 to log event messages from host IP address 192.0.2.31, use the following commands:

```
Node1# configure terminal
```

```
Node1(config)# log event-host 192.0.2.31 atmf-topology-event
```

To disable Node 1 to log event messages from host IP address 192.0.2.31, use the following commands:

```
Node1# configure terminal
```

```
Node1(config)# no log event-host 192.0.2.31 atmf-topology-event
```

Related commands [atmf topology-gui enable](#)

service http

Overview Use this command to enable the HTTP (Hypertext Transfer Protocol) service.
This service is required to support Vista Manager EX™ and the Device GUI.
Use the **no** variant of this command to disable the HTTP feature.

Syntax service http
no service http

Default Enabled

Mode Global Configuration

Example To enable the HTTP service, use the following commands:

```
awplus# configure terminal  
awplus(config)# service http
```

To disable the HTTP service, use the following commands:

```
awplus# configure terminal  
awplus(config)# no service http
```

Related commands [http port](#)
[http secure-port](#)
[show http](#)

show http

Overview This command shows the HTTP server settings.

Syntax show http

Mode User Exec and Privileged Exec

Example To show the HTTP server settings, use the command:

```
awplus# show http
```

Output The following shows typical output.

Example output from the show http command

```
awplus#show http
HTTP Server Configuration

-----
HTTP server                      : Enabled
Listen Addresses :
Secure                      : *:443
HTTP                      : *:80
Check API Content-Type Header : Disabled
TLS version minimum         : 1.2

Web GUI Information
-----
GUI file in use                : awplus-gui_555_41.gui

Server Certificate
-----

Subject      : O = Allied-Telesis, CN = AlliedwarePlusDefault, serialNumber =
<number>
Issuer       : O = "Allied Telesis, Inc.", CN = AlliedWarePlusCA, serialNumber =
<number>
Valid From   : Mar 15 14:09:40 2023 GMT
Valid To     : Mar  2 14:09:40 2073 GMT
Fingerprints :

SHA-1       : 8F:...EE
SHA-256     : 4F:...FF
```

Related commands [clear line vty](#)
[http check-api-content-type-header](#)
[http tls-version-minimum](#)
[service http](#)

3

File and Configuration Management Commands

- Contents**
- **Introduction** on page 77
 - **autoboot enable** on page 79
 - **boot config-file** on page 80
 - **boot config-file backup** on page 82
 - **boot system** on page 83
 - **boot system backup** on page 85
 - **cd** on page 86
 - **copy (filename)** on page 87
 - **copy debug** on page 89
 - **copy running-config** on page 90
 - **copy startup-config** on page 91
 - **copy zmodem** on page 92
 - **create autoboot** on page 93
 - **crypto verify** on page 94
 - **crypto verify bootrom** on page 96
 - **crypto verify signed** on page 98
 - **delete** on page 100
 - **delete debug** on page 101
 - **dir** on page 102
 - **edit** on page 104
 - **erase factory-default** on page 106
 - **erase startup-config** on page 107
 - **ip tftp source-interface** on page 108
 - **ipv6 tftp source-interface** on page 109
 - **mkdir** on page 110
 - **move** on page 111
 - **move debug** on page 112
 - **pwd** on page 113
 - **rmdir** on page 114
 - **show autoboot** on page 115
 - **show boot** on page 116
 - **show hash** on page 118
 - **show file** on page 119
 - **show file systems** on page 120
 - **show running-config** on page 123
 - **show running-config interface** on page 127
 - **show running-config unencrypted** on page 131

- **show startup-config** on page 132
- **show version** on page 133
- **strict-user-process-control** on page 134
- **strict-user-process-control force** on page 135
- **unmount** on page 136
- **write file** on page 137
- **write memory** on page 138
- **write terminal** on page 139

Introduction

Overview This chapter provides an alphabetical reference of AlliedWare Plus™ OS file and configuration management commands.

Filename syntax and keyword usage Many of the commands in this chapter use the placeholder 'filename' to represent the name and location of the file that you want to act on. The following table explains the syntax of the filename for each different type of file location.

When you copy a file...	Use this syntax:	Example:
Copying in local flash memory	flash:[/][<directory>/]<filename>	To specify a file in the configs directory in flash: flash:configs/example.cfg
Copying to or from a USB storage device	usb:[/][<directory>/]<filename>	To specify a file in the top-level directory of the USB stick: usb:example.cfg
Copying with HTTP	http://[[<username>:<password>]@]{<hostname>|<host-ip>}/<filepath>]/<filename>	To specify a file in the configs directory on the server: http://www.company.com/configs/example.cfg
Copying with TFTP	tftp://[<location>]/<directory>]/<filename>	To specify a file in the top-level directory of the server: tftp://172.11.1/example.cfg
Copying with SCP	scp://<username>@<location>[/<directory>]/<filename>	To specify a file in the configs directory on the server, logging on as user 'bob': e.g. scp://bob@10.10.0.12/configs/example.cfg
Copying with SFTP	sftp://[<location>]/<directory>]/<filename>	To specify a file in the top-level directory of the server: sftp://10.0.0.5/example.cfg

Valid characters The filename and path can include characters from up to four categories. The categories are:

1. uppercase letters: A to Z
2. lowercase letters: a to z
3. digits: 0 to 9
4. special symbols: most printable ASCII characters not included in the previous three categories, including the following characters:

- -
- /
- .
- _
- @
- "
- '
- *
- :
- ~
- ?

Do not use spaces, parentheses or the + symbol within filenames. Use hyphens or underscores instead.

Syntax for directory listings A leading slash (/) indicates the root of the current file system location. In commands where you need to specify the local file system's flash base directory, you may use **flash** or **flash:** or **flash:/**. For example, these commands are all the same:

- `dir flash`
- `dir flash:`
- `dir flash:/`

Similarly, you can specify the USB storage device base directory with **usb** or **usb:** or **usb:/**

You cannot name a directory or subdirectory **flash**, **nvs**, **usb**, **card**, **tftp**, **scp**, **sftp** or **http**. These keywords are reserved for tab completion when using various file commands.

autoboot enable

Overview This command enables the device to restore a release file and/or a configuration file from a USB storage device.

When the Autoboot feature is enabled, the device looks for a special file called `autoboot.txt` on the external media. If this file exists, the device will check the key and values in the file and recover the device with a new release file and/or configuration file from the external media. An example of a valid `autoboot.txt` file is shown in the following figure.

**Example
autoboot.txt
file**

```
[AlliedWare Plus]
Copy_from_external_media_enabled=yes
Boot_Release=x320-5.5.5-2.1.rel
Boot_Config=network1.cfg
```

Use the **no** variant of this command to disable the Autoboot feature.

Syntax `autoboot enable`
`no autoboot enable`

Default The Autoboot feature operates the first time the device is powered up in the field, after which the feature is disabled by default.

Mode Global Configuration

Example To enable the Autoboot feature, use the command:

```
awplus# configure terminal
awplus(config)# autoboot enable
```

**Related
commands** [create autoboot](#)
[show autoboot](#)
[show boot](#)

boot config-file

Overview Use this command to set the configuration file to use during the next boot cycle.

Use the **no** variant of this command to remove the configuration file.

Syntax boot config-file *<filepath-filename>*
no boot config-file

Parameter	Description
<i><filepath-filename></i>	Filepath and name of a configuration file. The specified configuration file must exist in the specified filesystem. Valid configuration files must have a .cfg extension.

Mode Global Configuration

Usage notes You can only specify that the configuration file is on a USB storage device if there is a backup configuration file already specified in flash. If you attempt to set the configuration file on a USB storage device and a backup configuration file is not specified in flash, the following error message is displayed:

```
% Backup configuration files must be stored in the flash
filesystem
```

For an explanation of the configuration fallback order, see the [File Management Feature Overview and Configuration Guide](#).

Examples To run the configuration file "branch.cfg" the next time the device boots up, when "branch.cfg" is stored on the device's flash filesystem, use the commands:

```
awplus# configure terminal
awplus(config)# boot config-file flash:/branch.cfg
```

To stop running the configuration file "branch.cfg" when the device boots up, when "branch.cfg" is stored on the device's flash filesystem, use the commands:

```
awplus# configure terminal
awplus(config)# no boot config-file flash:/branch.cfg
```

To run the configuration file "branch.cfg" the next time the device boots up, when "branch.cfg" is stored on a USB storage device, use the commands:

```
awplus# configure terminal
awplus(config)# boot config-file usb:/branch.cfg
```

To stop running the configuration file "branch.cfg" when the device boots up, when "branch.cfg" is stored on a USB storage device, use the commands:

```
awplus# configure terminal
awplus(config)# no boot config-file usb:/branch.cfg
```

Related commands

- boot config-file backup**
- boot system**
- boot system backup**
- show boot**

boot config-file backup

Overview Use this command to set a backup configuration file to use if the main configuration file cannot be accessed.

Use the **no** variant of this command to remove the backup configuration file.

Syntax boot config-file backup <filepath-filename>
no boot config-file backup

Parameter	Description
<filepath-filename>	Filepath and name of a backup configuration file. Backup configuration files must be in the flash filesystem. Valid backup configuration files must have a .cfg extension.
backup	The specified file is a backup configuration file.

Mode Global Configuration

Usage notes For an explanation of the configuration fallback order, see the [File Management Feature Overview and Configuration Guide](#).

Examples To set the configuration file backup.cfg as the backup to the main configuration file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# boot config-file backup flash:/backup.cfg
```

To remove the configuration file backup.cfg as the backup to the main configuration file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no boot config-file backup flash:/backup.cfg
```

Related commands [boot config-file](#)
[boot system](#)
[boot system backup](#)
[show boot](#)

boot system

Overview Use this command to set the release file to load during the next boot cycle.

Use the **no** variant of this command to stop specifying a primary release file to boot from. If the device boots up with no release file set, it will use autoboot or the backup release file if either of those are configured. You can also use the boot menu to select a release file source. To access the boot menu, type Ctrl-B at bootup.

Syntax boot system <filepath-filename>
no boot system

Parameter	Description
<filepath-filename>	Filepath and name of a release file. The specified release file must exist and must be stored in the root directory of the specified filesystem. Valid release files must have a .rel extension.

Mode Global Configuration

Usage notes You can only specify that the release file is on a USB storage device if there is a backup release file already specified in flash. If you attempt to set the release file on a USB storage device and a backup release file is not specified in flash, the following error message is displayed:

```
% A backup boot image must be set before setting a current boot
image on USB storage device
```

Examples To boot up with the release file x320-5.5.5-2.1.rel the next time the device boots up, when the release file is stored on the device's flash filesystem, use the commands:

```
awplus# configure terminal
awplus(config)# boot system flash:/x320-5.5.5-2.1.rel
```

To run the release file x320-5.5.5-2.1.rel the next time the device boots up, when the release file is stored on a USB storage device, use the commands:

```
awplus# configure terminal
awplus(config)# boot system usb:/x320-5.5.5-2.1.rel
```

Related commands **boot config-file**
boot config-file backup
boot system backup
show boot

boot system backup

Overview Use this command to set a backup release file to load if the main release file cannot be loaded.

Use the **no** variant of this command to stop specifying a backup release file.

Syntax boot system backup <filepath-filename>
no boot system backup

Parameter	Description
<filepath-filename>	Filepath and name of a backup release file. Backup release files must be in the Flash filesystem. Valid release files must have a .rel extension.
backup	The specified file is a backup release file.

Mode Global Configuration

Examples To specify the file x320-5.5.5-1.1.rel as the backup to the main release file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# boot system backup flash:/x320-5.5.5-1.1.rel
```

To stop specifying a backup to the main release file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no boot system backup
```

Related commands [boot config-file](#)
[boot config-file backup](#)
[boot system](#)
[show boot](#)

cd

Overview This command changes the current working directory.

Syntax `cd <directory-name>`

Parameter	Description
<code><directory-name></code>	Name and path of the directory.

Mode Privileged Exec

Example To change to the directory called `images`, use the command:

```
awplus# cd images
```

Related commands [dir](#)
[pwd](#)
[show file systems](#)

copy (filename)

Overview This command copies a file. This allows you to:

- copy files from your device to a remote device
- copy files from a remote device to your device
- copy files stored on Flash memory to or from a different memory type, such as a USB storage device
- create two copies of the same file on your device

Syntax copy [force] <source-name> <destination-name>

Parameter	Description
force	This parameter forces the copy command to overwrite the destination file, if it already exists, without prompting the user for confirmation.
<source-name>	The filename and path of the source file. See Introduction for valid syntax.
<destination-name>	The filename and path for the destination file. See Introduction for valid syntax.

Mode Privileged Exec

Examples To use TFTP to copy the file “bob.key” into the current directory from the remote server at 10.0.0.1, use the command:

```
awplus# copy tftp://10.0.0.1/bob.key bob.key
```

To use SFTP to copy the file “new.cfg” into the current directory from a remote server at 10.0.1.2, use the command:

```
awplus# copy sftp://10.0.1.2/new.cfg bob.key
```

To use SCP with the username “beth” to copy the file old.cfg into the directory config_files on a remote server that is listening on TCP port 2000, use the command:

```
awplus# copy scp://beth@serv:2000/config_files/old.cfg old.cfg
```

To copy the file “newconfig.cfg” onto your device’s Flash from a USB storage device, use the command:

```
awplus# copy usb:/newconfig.cfg flash:/newconfig.cfg
```

To copy the file “newconfig.cfg” to a USB storage device from your device’s Flash, use the command:

```
awplus# copy flash:/newconfig.cfg usb:/newconfig.cfg
```

To copy the file “config.cfg” into the current directory from a USB storage device, and rename it to “configtest.cfg”, use the command:

```
awplus# copy usb:/config.cfg configtest.cfg
```

To copy the file “config.cfg” into the current directory from a remote file server, and rename it to “configtest.cfg”, use the command:

```
awplus# copy fserver:/config.cfg configtest.cfg
```

On an AMF network, to copy the device GUI file from the AMF master to the Flash memory of ‘node_1’, use the command:

```
master# copy awplus-gui_549_13.gui node_1.atmf/flash:
```

Related commands

- [copy zmodem](#)
- [copy buffered-log](#)
- [copy permanent-log](#)
- [show file systems](#)

copy debug

Overview This command copies a specified debug file to a destination file.

Syntax `copy debug {<destination-name>|debug|flash|nvs|scp|tftp|usb}
{<source-name>|debug|flash|nvs|scp|tftp|usb}`

Parameter	Description
<code><destination-name></code>	The filename and path where you would like the debug output saved. See Introduction for valid syntax.
<code><source-name></code>	The filename and path where the debug output originates. See the Introduction to this chapter for valid syntax.

Mode Privileged Exec

Example To copy debug output to a file on flash called “my-debug”, use the following command:

```
awplus# copy debug flash:my-debug
```

To copy debug output to a USB storage device with a filename “my-debug”, use the following command:

```
awplus# copy debug usb:my-debug
```

Output The following shows typical output.

CLI prompt after entering the copy debug command

```
Enter source file name []:
```

Related commands [delete debug](#)
[move debug](#)

copy running-config

Overview This command copies the running-config to a destination file, or copies a source file into the running-config. Commands entered in the running-config do not survive a device reboot unless they are saved in a configuration file.

Syntax `copy <source-name> running-config`
`copy running-config [<destination-name>]`
`copy running-config startup-config`

Parameter	Description
<code><source-name></code>	The filename and path of a configuration file. This must be a valid configuration file with a .cfg filename extension. Specify this when you want the script in the file to become the new running-config. See Introduction for valid syntax.
<code><destination-name></code>	The filename and path where you would like the current running-config saved. This command creates a file if no file exists with the specified filename. If a file already exists, then the CLI prompts you before overwriting the file. See Introduction for valid syntax. If you do not specify a file name, the device saves the running-config to a file called default.cfg.
<code>startup-config</code>	Copies the running-config into the file set as the current startup-config file.

Mode Privileged Exec

Examples To copy the running-config into the startup-config, use the command:

```
awplus# copy running-config startup-config
```

To copy the file 'layer3.cfg' into the running-config, use the command:

```
awplus# copy layer3.cfg running-config
```

To use SCP to copy the running-config as 'current.cfg' to the remote server listening on TCP port 2000, use the command:

```
awplus# copy running-config scp://user@server:2000/config_files/  
current.cfg
```

Related commands [copy startup-config](#)
[write file](#)
[write memory](#)

copy startup-config

Overview This command copies the startup-config script into a destination file, or alternatively copies a configuration script from a source file into the startup-config file. Specify whether the destination is Flash or USB when loading from the local filesystem.

Syntax copy <source-name> startup-config
copy startup-config <destination-name>

Parameter	Description
<source-name>	The filename and path of a configuration file. This must be a valid configuration file with a .cfg filename extension. Specify this to copy the script in the file into the startup-config file. Note that this does not make the copied file the new startup file, so any further changes made in the configuration file are not added to the startup-config file unless you reuse this command. See Introduction for valid syntax.
<destination-name>	The destination and filename that you are saving the startup-config as. This command creates a file if no file exists with the specified filename. If a file already exists, then the CLI prompts you before overwriting the file. See Introduction for valid syntax.

Mode Privileged Exec

Examples To copy the file 'Layer3.cfg' to the startup-config, use the command:

```
awplus# copy Layer3.cfg startup-config
```

To copy the startup-config as the file 'oldconfig.cfg' in the current directory, use the command:

```
awplus# copy startup-config oldconfig.cfg
```

Related commands [copy running-config](#)

copy zmodem

Overview This command allows you to copy files using ZMODEM using Minicom. ZMODEM works over a serial connection and does not need any interfaces configured to do a file transfer.

Syntax copy <source-name> zmodem
copy zmodem

Parameter	Description
<source-name>	The filename and path of the source file. See Introduction for valid syntax.

Mode Privileged Exec

Example To copy the local file 'asuka.key' using ZMODEM, use the command:

```
awplus# copy asuka.key zmodem
```

Related commands [copy \(filename\)](#)
[show file systems](#)

create autoboot

Overview Use this command to create an autoboot.txt file on an external storage device. This command will automatically ensure that the keys and values that are expected in this file are correct. After the file is created the **create autoboot** command will copy the current release and configuration files across to the external storage device. The external storage device is then available to restore a release file and/or a configuration file to the device.

Syntax create autoboot usb

Mode Privileged Exec

Example To create an autoboot.txt file on a USB storage device, use the command:
awplus# create autoboot usb

Related commands [autoboot enable](#)
[show autoboot](#)
[show boot](#)

crypto verify

Overview Use this command to compare the SHA256 checksum of a file with its correct checksum. This confirms that the file has not been corrupted or interfered with during download. You can verify any kind of file, but you cannot specify a file path, so the file must be stored in the top level of the device's flash memory.



CAUTION: *If a file fails to verify and you believe the file may have been interfered with, we recommend immediately performing a security audit of your network.*

Once the device has verified the file, you can use the **copy running-config startup-config** command to save the file/hash pair in the running configuration. If you do this, the device will verify the file every time it boots up and will take action if the verification fails.

The action taken when verification fails on boot-up depends on the type of file and whether the device is in Secure Mode:

- If the device is in Secure Mode and the boot-up firmware file fails verification, the device will not boot. Contact Allied Telesis support if this happens.
- If the device is not in Secure Mode and the boot-up firmware file fails verification, the device will display the following warning message after booting: "% Verification Failed". If this occurs because the saved hash is incorrect, use this command to replace the hash. If this occurs because the firmware file is corrupted or may have been interfered with, ensure that your device is secure, then replace the failed file with a known good file and reboot.
- If you use the **gui** parameter and the GUI fails verification, the device will boot up but the GUI will be disabled (the **service http** command will be disabled).
- If any other file fails verification, the device will display the following warning message after booting: "% Verification Failed"

You can use the **show hash** command to see the current hash of a file.

Use the **no** variant of this command to remove a verified filename/hash combination from the running configuration.

Syntax `crypto verify <filename> <hash-value>`
`crypto verify gui <hash-value>`
`no crypto verify <filename>`

Parameter	Description
<code><filename></code>	The AlliedWare Plus file that you want to verify
<code>gui</code>	Verify the current Device GUI file
<code><hash-value></code>	The known correct checksum of the file. For firmware and GUI files, the correct checksum is listed in the sha256sum file that is available from the Allied Telesis Download Center.

Default No default

Mode Global Configuration

Usage notes All models of a particular series run the same firmware file and therefore have the same checksum for that firmware file. For example, all x930 Series switches have the same checksum.

If your network has extremely strict security requirements, such as FIPS compliance, you may need to verify the bootloader on boot-up and use signature verification for the firmware file. To configure these, use the commands **crypto verify bootrom** and **crypto verify signed**. These commands make it difficult to upgrade the bootloader or firmware, so only use them if necessary.

Examples To verify the firmware file for 5.5.3-0.1 on an x930 Series switch, use the commands:

```
awplus# configure terminal
awplus(config)# crypto verify x930-5.5.3-0.1.rel
7f22d8a30c991a4ddc0a2aed47246282b23b4e4a865e07f79795c0959c47de78
```

Related commands **crypto secure-mode**
crypto verify bootrom
crypto verify signed
show hash
show secure-mode

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices
Version 5.5.3-0.1: **gui** parameter added; **<filename>** parameter expanded to cover all file types

crypto verify bootrom

Overview Use this command to compare the SHA256 checksum hash value of a bootloader with its correct checksum. This confirms that the bootloader has not been corrupted or interfered with.

If the verification fails, contact Allied Telesis customer support.

If the device is in Secure Mode, running **crypto verify bootrom** also stores the hash value permanently. When in Secure Mode, we recommend only using this command in networks with extremely strict security requirements, such as in FIPS-compliant networks. This is because you can only remove the hash value by erasing flash memory (for example, by using the **erase factory-default** command).

If the device is not in Secure Mode, you can use the **write** command to save the hash value to the boot configuration file. The device will verify the checksum every time it boots up and will warn you if it fails the verification.

When not in Secure Mode, you can use the **no** variant of this command to remove the bootrom/hash combination from the running configuration.

Syntax `crypto verify bootrom <hash-value>`
`no crypto verify <filename>`

Parameter	Description
<code><hash-value></code>	The known correct checksum of the bootloader. To see the correct hash value, run the command show hash bootrom straight after you first boot the device up, or check the Deployment Guide for the device.

Default No default

Mode Global Configuration

Usage notes Please use this command in accordance with the User Guidance documentation for your required security certification.

All models of a particular series run the same bootloader file and therefore have the same checksum. For example, all x930 Series switches have the same bootloader checksum.

Examples To verify the bootrom file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# crypto verify bootrom  
5e80e70b6a2200965abf5f62f72af1bdc1654f3726bdf554afcbd76270c91
```

Note that the hash in this example is an example only; it is not the hash of the device's bootloader.

Related commands

- crypto secure-mode**
- crypto verify**
- crypto verify signed**
- show hash**
- show secure-mode**

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices

crypto verify signed

Overview Use this command to compare the HMAC-SHA checksum hash value of a firmware file with its correct checksum. This confirms that the firmware has not been corrupted or interfered with. When the device is in Secure Mode, this command also forces the device to check the hash whenever it boots up, and prevents the device from booting if the verification fails.

Caution:

If the device is in Secure Mode, this command makes it difficult to upgrade the device's firmware file. Therefore, only use this command if the device is in Secure Mode and you have extremely strict security requirements, such as in FIPS-compliant networks. Otherwise, use the **crypto verify** command. See the Usage Notes below for more detail.

If the verification fails, contact Allied Telesis customer support.

Syntax `crypto verify signed <filename> <hash-value>`

Parameter	Description
<code><filename></code>	The AlliedWare Plus file that you want to verify
<code><hash-value></code>	The known correct checksum of the file. This is a keyed HMAC-SHA hash. This is available in a .sig file, which you can get from your Allied Telesis customer representative.

Default No default

Mode Global Configuration

Usage notes **Caution:**

If the device is in Secure Mode, and if the firmware file verified is the boot release and signed verification succeeds, then the device stores the signed hash and uses it to verify the firmware file on all subsequent reboots. This means that if you change the firmware version, the switch will not boot up. You can only change the firmware version if you reset the switch to the factory defaults **before** changing the firmware version, by using the command **erase factory-default**.

If the device is not in Secure Mode, you can use the **write** command to save the hash value to the boot configuration file. The device will verify the checksum every time it boots up and will warn you if it fails the verification.

All models of a particular series run the same release file and therefore have the same checksum. For example, all x930 Series switches have the same checksum.

Examples To use signature verification to verify the firmware file for 5.5.3-0.1 on an x930 Series switch, use the commands:

```
awplus# configure terminal
awplus(config)# crypto verify signed x930-5.5.3-0.1.rel
3f50420644aebd277dd48b3aee30639801348896ffffce231fc5615995ecde5d9
```

Related commands

- [crypto secure-mode](#)
- [crypto verify](#)
- [crypto verify bootrom](#)
- [show hash](#)
- [show secure-mode](#)

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices

delete

Overview This command deletes files or directories.

Syntax delete [force] [recursive] <filename>

Parameter	Description
force	Ignore nonexistent filenames and never prompt before deletion.
recursive	Remove the contents of directories recursively.
<filename>	The filename and path of the file to delete. See Introduction for valid syntax.

Mode Privileged Exec

Examples To delete the file temp.cfg from the current directory, use the command:

```
awplus# delete temp.cfg
```

To delete the read-only file one.cfg from the current directory, use the command:

```
awplus# delete force one.cfg
```

To delete the directory old_configs, which is not empty, use the command:

```
awplus# delete recursive old_configs
```

To delete the directory new_configs, which is not empty, without prompting if any read-only files are being deleted, use the command:

```
awplus# delete force recursive new_configs
```

Related commands [erase startup-config](#)
[rmdir](#)

delete debug

Overview Use this command to delete a specified debug output file.

Syntax delete debug <source-name>

Parameter	Description
<source-name>	The filename and path where the debug output originates. See Introduction for valid URL syntax.

Mode Privileged Exec

Example To delete debug output, use the following command:

```
awplus# delete debug
```

Output The following shows typical output.

CLI prompt after entering the delete debug command

```
Enter source file name []:
```

Related commands [copy debug](#)
[move debug](#)

dir

Overview This command lists the files on a filesystem. If you don't specify a directory or file, then this command lists the files in the current directory.

Syntax `dir [recursive] [sort [reverse] [name|size|time]] [<filename>|debug|flash|nvs|usb]`

Parameter	Description
recursive	List the contents of directories recursively.
sort	Sort directory listing.
reverse	Sort using reverse order.
name	Sort by name.
size	Sort by size.
time	Sort by modification time (default).
<filename>	The name of the directory or file. If you don't specify a directory or file, then this command lists the files in the current directory.
debug	Debug root directory.
flash	Flash memory root directory.
nvs	NVS memory root directory.
usb	USB storage device root directory.

Mode Privileged Exec

Examples To list the files in the current working directory, use the command:

```
awplus# dir
```

To list the files in the root of the Flash filesystem, use the command:

```
awplus# dir flash
```

To list recursively the files in the Flash filesystem, use the command:

```
awplus# dir recursive flash:
```

To list the files in alphabetical order, use the command:

```
awplus# dir sort name
```

To list the files by size, smallest to largest, use the command:

```
awplus# dir sort reverse size
```

To sort the files by modification time, oldest to newest, use the command:

```
awplus# dir sort reverse time
```

Output The following shows typical output.

Example output from the dir command

```
awplus#dir
  630 -rw- Nov 25 2022 23:36:31 example.cfg
23652123 -rw- Nov 25 2022 03:41:18 x320-5.5.5-2.1.rel
  149 -rw- Nov 25 2022 00:40:35 exception.log
```

Related commands [cd](#)
[mkdir](#)
[pwd](#)

edit

- Overview** This command opens a text file in the AlliedWare Plus™ text editor. Once opened you can use the editor to alter to the file.
- If you specify a filename and the file already exists, then the editor opens it in the text editor.
- If you do not enter a filename, the editor opens an empty file and prompts you for a name when you exit the editor.
- For information about using the editor, including control sequences, see the [File Management Feature Overview and Configuration Guide](#).

Syntax `edit [<filename>]`
`edit <remote-file>`

Parameter	Description
<code><filename></code>	The name of a file in the local Flash filesystem.
<code><remote-file></code>	The filename and path of the remote file. See Introduction for valid syntax.

Mode Privileged Exec

Usage notes Note that files in remote filesystems cannot be edited from the text editor (e.g. files on a TFTP server). Such files will open read-only.

Before starting the editor make sure your terminal, terminal emulation program, or Telnet client is 100% compatible with a VT100 terminal. The editor uses VT100 control sequences to display text on the terminal.

Examples To create and edit a new text file, use the command:

```
awplus# edit
```

To edit the existing configuration file myconfig.cfg stored on your device's Flash memory, use the command:

```
awplus# edit myconfig.cfg
```

To edit the file example.cfg stored in a directory called backups on a USB stick, use the command:

```
awplus# edit usb:/backups/example.cfg
```

To view the file bob.cfg stored in configs directory of a TFTP server, use the command:

```
awplus# edit tftp://configs/bob.cfg
```

Related **copy (filename)**
commands **dir**
mkdir
show file

erase factory-default

Overview This command erases all data from NVS and all data from flash **except** the following:

- the boot release file (a .rel file) and its release setting file
- all license files
- the latest GUI release file

The device is then rebooted and returned to its factory default condition. The device can then be used for AMF automatic node recovery.

Syntax erase factory-default

Mode Privileged Exec

Usage notes This command is an alias to the **atmf cleanup** command.

Note that you cannot use this command if you have **strict-user-process-control** enabled. Disable it before entering the **erase factory-default** command.

Example To erase data, use the command:

```
Node_1# erase factory-default
```

```
This command will erase all NVS, all flash contents except for  
the boot release, a GUI resource file, and any license files,  
and then reboot the switch. Continue? (y/n):y
```

Related commands **atmf cleanup**

erase startup-config

Overview This command deletes the file that is set as the startup-config file, which is the configuration file that the system runs when it boots up.

At the next restart, the device loads the default configuration file, default.cfg. If default.cfg no longer exists, then the device loads with the factory default configuration. This provides a mechanism for you to return the device to the factory default settings.

Syntax erase startup-config

Mode Privileged Exec

Example To delete the file currently set as the startup-config, use the command:

```
awplus# erase startup-config
```

Related commands

- boot config-file backup**
- copy running-config**
- copy startup-config**
- show boot**

ip tftp source-interface

Overview Use this command to manually specify the IP address that all TFTP requests originate from. This is useful in network configurations where TFTP servers only accept requests from certain devices, or where the server cannot dynamically determine the source of the request.

Use the **no** variant of this command to stop specifying a source.

Syntax `ip tftp source-interface {<interface>|<ip-add>}`
`no ip tftp source-interface`

Parameter	Description
<interface>	The VLAN that TFTP requests originate from. The device will use the IP address of this interface as its source IP address.
<ip-add>	The IP address that TFTP requests originate from, in dotted decimal format.

Default There is no default source specified.

Mode Global Configuration

Usage This command is helpful in network configurations where TFTP traffic needs to traverse point-to-point links or subnets within your network, and you do not want to propagate those point-to-point links through your routing tables.

In those circumstances, the TFTP server cannot dynamically determine the source of the TFTP request, and therefore cannot send the requested data to the correct device. Specifying a source interface or address enables the TFTP server to send the data correctly.

Example To specify that TFTP requests originate from the IP address 192.0.2.1, use the following commands:

```
awplus# configure terminal
awplus(config)# ip tftp source-interface 192.0.2.1
```

Related commands [copy \(filename\)](#)

ipv6 tftp source-interface

Overview Use this command to manually specify the IPv6 address that all TFTP requests originate from. This is useful in network configurations where TFTP servers only accept requests from certain devices, or where the server cannot dynamically determine the source of the request.

Use the **no** variant of this command to stop specifying a source.

Syntax `ipv6 tftp source-interface {<interface>|<ipv6-add>}`
`no ipv6 tftp source-interface`

Parameter	Description
<interface>	The VLAN that TFTP requests originate from. The device will use the IPv6 address of this interface as its source IPv6 address.
<ipv6-add>	The IPv6 address that TFTP requests originate from, in the format x:x::x:x, for example, 2001:db8::8a2e:7334.

Default There is no default source specified.

Mode Global Configuration

Usage This command is helpful in network configurations where TFTP traffic needs to traverse point-to-point links or subnets within your network, and you do not want to propagate those point-to-point links through your routing tables.

In those circumstances, the TFTP server cannot dynamically determine the source of the TFTP request, and therefore cannot send the requested data to the correct device. Specifying a source interface or address enables the TFTP server to send the data correctly.

Example To specify that TFTP requests originate from the IPv6 address 2001:db8::8a2e:7334, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 tftp source-interface 2001:db8::8a2e:7334
```

Related commands [copy \(filename\)](#)

mkdir

Overview This command makes a new directory.

Syntax `mkdir <name>`

Parameter	Description
<code><name></code>	The name and path of the directory that you are creating.

Mode Privileged Exec

Usage You cannot name a directory or subdirectory **flash**, **nvs**, **usb**, **card**, **tftp**, **scp**, **sftp** or **http**. These keywords are reserved for tab completion when using various file commands.

Example To make a new directory called `images` in the current directory, use the command:

```
awplus# mkdir images
```

Related commands [cd](#)
[dir](#)
[pwd](#)

move

Overview This command renames or moves a file.

Syntax `move <source-name> <destination-name>`

Parameter	Description
<code><source-name></code>	The filename and path of the source file. See Introduction for valid syntax.
<code><destination-name></code>	The filename and path of the destination file. See Introduction for valid syntax.

Mode Privileged Exec

Examples To rename the file `temp.cfg` to `startup.cfg`, use the command:

```
awplus# move temp.cfg startup.cfg
```

To move the file `temp.cfg` from the root of the Flash filesystem to the directory `myconfigs`, use the command:

```
awplus# move temp.cfg myconfigs/temp.cfg
```

Related commands

- [delete](#)
- [edit](#)
- [show file](#)
- [show file systems](#)

move debug

Overview This command moves a specified debug file to a destination debug file.

Syntax `move debug {<destination-name>|debug|nvs|flash|usb}`

Parameter	Description
<code><destination-name></code>	The filename and path where you would like the debug output moved to. See Introduction for valid syntax.

Mode Privileged Exec

Example To move debug output into Flash memory with a filename “my-debug”, use the following command:

```
awplus# move debug flash:my-debug
```

To move debug output onto a USB storage device with a filename “my-debug”, use the following command:

```
awplus# move debug usb:my-debug
```

Output

Enter source file name []:

Related commands [copy debug](#)
[delete debug](#)

pwd

Overview This command prints the current working directory.

Syntax pwd

Mode Privileged Exec

Example To print the current working directory, use the command:

```
awplus# pwd
```

Related commands **cd**

rmkdir

Overview This command removes a directory. This command only works on empty directories, unless you specify the optional **force** keyword.

Syntax `rmkdir [force] <name>`

Parameter	Description
force	Optional keyword that allows you to delete directories that are not empty and contain files or subdirectories.
<name>	The name and path of the directory.

Mode Privileged Exec

Examples To remove the directory "images" from the top level of the Flash filesystem, use the command:

```
awplus# rmkdir flash:/images
```

To create a directory called "level1" containing a subdirectory called "level2", and then force the removal of both directories, use the commands:

```
awplus# mkdir level1
awplus# mkdir level1/level2
awplus# rmkdir force level1
```

Related commands

- [cd](#)
- [dir](#)
- [mkdir](#)
- [pwd](#)

show autoboot

Overview This command displays the Autoboot configuration and status.

Syntax show autoboot

Mode Privileged Exec

Example To show the Autoboot configuration and status, use the command:

```
awplus# show autoboot
```

Output The following shows typical output.

Example output from the show autoboot command

```
awplus#show autoboot
Autoboot configuration
-----
Autoboot status           : enabled
USB file autoboot.txt exists : yes

Restore information on USB
Autoboot enable in autoboot.txt : yes
Restore release file       : x320-5.5.5-2.1.rel (file exists)
Restore configuration file  : network_1.cfg (file exists)
```

Example output from the show autoboot command when an external media source is not present

```
awplus#show autoboot
Autoboot configuration
-----
Autoboot status           : enabled
External media source     : USB not found.
```

Related commands [autoboot enable](#)
[create autoboot](#)
[show boot](#)

show boot

Overview This command displays the current boot configuration.
We recommend that the currently running release is set as the current boot image.

Syntax show boot

Mode Privileged Exec

Example To show the current boot configuration, use the command:
awplus# show boot

Output The following shows typical output.

Example output from show boot

```
awplus#show boot
Boot configuration
-----
Current software   : x320-5.5.5-2.1.rel
Current boot image : flash:/x320-5.5.5-2.1.rel
Backup boot image  : flash:/x320-5.5.5-1.1.rel
Default boot config: flash:/default.cfg
Current boot config: flash:/my.cfg (file exists)
Backup boot config: flash:/backup.cfg (file not found)
Autoboot status    : disabled
```

Parameters in the output from show boot

Parameter	Description
Current software	The current software release that the device is using.
Current boot image	The boot image currently configured for use during the next boot cycle.
Backup boot image	The boot image to use during the next boot cycle if the device cannot load the main image.
Default boot config	The default startup configuration file. The device loads this configuration script if no file is set as the startup- config file.
Current boot config	The configuration file currently configured as the startup-config file. The device loads this configuration file during the next boot cycle if this file exists.
Backup boot config	The configuration file to use during the next boot cycle if the main configuration file cannot be loaded.
Autoboot status	The status of the Autoboot feature; either enabled or disabled.

Related commands

- [autoboot enable](#)
- [boot config-file backup](#)
- [boot system backup](#)
- [show autoboot](#)

show hash

Overview Use this command to display the hash for a specified file on the device, or for the device's current bootloader.

Syntax show hash <filename>
show hash bootrom

Parameter	Description
<filename>	The name of the file to display the hash for.
bootrom	Display the hash for the current bootloader.

Mode Privileged Exec

Examples To show the hash for the GUI file named awplus-gui_552_27.gui, use the command:

```
awplus# show hash awplus-gui_552_27.gui
```

To show the hash for a file named 'example.txt', which is in the folder named 'example' in flash memory, use the command:

```
awplus# show hash flash://example/example.txt
```

To show the hash for the bootloader, use the command:

```
awplus# show hash bootrom
```

Output The following shows typical output.

Example output from show hash

```
awplus#show hash awplus-gui_552_27.gui  
b793e2c7fc5580513472017f964316f3bb0e79fbf1ddfd6f3844a2a8311c5c64
```

Related commands [crypto secure-mode](#)
[crypto verify](#)
[crypto verify bootrom](#)

Command changes Version 5.5.3-0.1: command added

show file

Overview This command displays the contents of a specified file.

Syntax show file <filename>

Parameter	Description
<filename>	Name of a file on the local Flash filesystem, or name and directory path of a file.

Mode Privileged Exec

Example To display the contents of the file `oldconfig.cfg`, which is in the current directory, use the command:

```
awplus# show file oldconfig.cfg
```

Related commands [edit](#)
[show file systems](#)

show file systems

Overview This command lists the file systems and their utilization information where appropriate.

Syntax show file systems

Mode Privileged Exec

Examples To display the file systems, use the command:
awplus# show file systems

Output The following shows typical output.

```
awplus#show file systems
```

Size(b)	Free(b)	Type	Flags	Prefixes	S/D/V	Lcl/Ntwk	Avail
95.8M	94.0M	flash	rw	flash:	static	local	Y
-	-	system	rw	system:	virtual	local	-
10.0M	9.9M	debug	rw	debug:	static	local	Y
107.0K	88.0K	nvs	rw	nvs:	static	local	Y
7.0G	4.6G	usbstick	rw	usb:	dynamic	local	Y
-	-	fserver	rw	fserver:	dynamic	network	N
-	-	tftp	rw	tftp:	-	network	-
-	-	scp	rw	scp:	-	network	-
-	-	sftp	ro	sftp:	-	network	-
-	-	http	ro	http:	-	network	-
-	-	rsync	rw	rsync:	-	network	-

Parameters in the output of the show file systems command

Parameter	Description
Size (b)	The total memory available to this file system. The units are given after the value and are M for Megabytes or K for kilobytes.
Free (b)	The total memory free within this file system. The units are given after the value and are M for Megabytes or K for kilobytes.
Type	The memory type used for this file system, such as: flash system nvs usbstick tftp scp sftp http.
Flags	The file setting options: rw (read write), ro (read only).
Prefixes	The prefixes used when entering commands to access the file systems, such as: flash system nvs usb tftp scp sftp

Parameter	Description
	http.
S/D/V	The memory type: Static, Dynamic, Virtual.
Lcl / Ntwk	Whether the memory is located locally or via a network connection.
Avail	Whether the memory is accessible: Y (yes), N (no), - (not applicable)

Related [edit](#)
commands [show file](#)

show running-config

Overview This command displays the current configuration of your device. Its output includes all non-default configuration. The default settings are not displayed.

NOTE: You can control the output by entering *|* or *>* at the end of the command:

- To display only lines that contain a particular word, enter:
| include <word>
- To start the display at the first line that contains a particular word, enter:
| begin <word>
- To save the output to a file, enter:
> <filename>

Syntax `show running-config [full|<feature>]`

Parameter	Description																																																		
full	Display the running-config for all features. This is the default setting, so it is the same as entering show running-config .																																																		
<feature>	Display only the configuration for a single feature. The features available depend on your device and will be some of the following list: <table> <tr> <td>access-list</td><td>ACL configuration</td></tr> <tr> <td>antivirus</td><td>Antivirus configuration</td></tr> <tr> <td>application</td><td>Application configuration</td></tr> <tr> <td>as-path</td><td>Autonomous system path filter configuration</td></tr> <tr> <td>as-path access-list</td><td>Configuration of ACLs for AS path filtering</td></tr> <tr> <td>atmf</td><td>Allied Telesis Management Framework configuration</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP) configuration</td></tr> <tr> <td>community-list</td><td>Community-list configuration</td></tr> <tr> <td>crypto</td><td>Security-specific configuration</td></tr> <tr> <td>dhcp</td><td>DHCP configuration</td></tr> <tr> <td>dpi</td><td>Deep Packet Inspection configuration</td></tr> <tr> <td>entity</td><td>Entity configuration</td></tr> <tr> <td>firewall</td><td>Firewall configuration</td></tr> <tr> <td>interface</td><td>Interface configuration. See show running-config interface for further options.</td></tr> <tr> <td>ip</td><td>Internet Protocol (IP) configuration</td></tr> <tr> <td>ip pim dense-mode</td><td>PIM-DM configuration</td></tr> <tr> <td>ip pim sparse-mode</td><td>PIM-SM configuration</td></tr> <tr> <td>ip route</td><td>IP static route configuration</td></tr> <tr> <td>ip-reputation</td><td>IP Reputation configuration</td></tr> <tr> <td>ips</td><td>IPS configuration</td></tr> <tr> <td>ipsec</td><td>Internet Protocol Security (IPsec) configuration</td></tr> <tr> <td>ipv6</td><td>Internet Protocol version 6 (IPv6) configuration</td></tr> <tr> <td>ipv6 access-list</td><td>IPv6 ACL configuration</td></tr> <tr> <td>ipv6 mroute</td><td>IPv6 multicast route configuration</td></tr> <tr> <td>ipv6 prefix-list</td><td>IPv6 prefix list configuration</td></tr> </table>	access-list	ACL configuration	antivirus	Antivirus configuration	application	Application configuration	as-path	Autonomous system path filter configuration	as-path access-list	Configuration of ACLs for AS path filtering	atmf	Allied Telesis Management Framework configuration	bgp	Border Gateway Protocol (BGP) configuration	community-list	Community-list configuration	crypto	Security-specific configuration	dhcp	DHCP configuration	dpi	Deep Packet Inspection configuration	entity	Entity configuration	firewall	Firewall configuration	interface	Interface configuration. See show running-config interface for further options.	ip	Internet Protocol (IP) configuration	ip pim dense-mode	PIM-DM configuration	ip pim sparse-mode	PIM-SM configuration	ip route	IP static route configuration	ip-reputation	IP Reputation configuration	ips	IPS configuration	ipsec	Internet Protocol Security (IPsec) configuration	ipv6	Internet Protocol version 6 (IPv6) configuration	ipv6 access-list	IPv6 ACL configuration	ipv6 mroute	IPv6 multicast route configuration	ipv6 prefix-list	IPv6 prefix list configuration
access-list	ACL configuration																																																		
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ipv6 prefix-list	IPv6 prefix list configuration																																																		

Parameter	Description
ipv6 route	IPv6 static route configuration
isakmp	Internet Security Association Key Management Protocol (ISAKMP) configuration
key chain	Authentication key management configuration
l2tp-profile	L2TP tunnel profile configuration
lldp	LLDP configuration
log	Logging utility configuration
malware-protection	Malware protection configuration
nat	Network Address Translation configuration
power-inline	Power over Ethernet (PoE) configuration
policy-based-routing	Policy-based routing (PBR) configuration
pppoe-ac	PPPoE access concentrator configuration
prefix-list	Prefix-list configuration
route-map	Route-map configuration
router	Router configuration
router-id	Configuration of the router identifier for this system
security-password	Strong password security configuration
snmp	SNMP configuration
ssh	Secure Shell configuration
switch	Switch configuration
web-control	Web Control configuration

Mode Privileged Exec and Global Configuration

Example To display the current configuration of your device, use the command:

```
awplus# show running-config
```

Output The following shows typical output.

Example output from show running-config

```
awplus#show running-config
!
service password-encryption
!
no banner motd
!
username manager privilege 15 password 8 $1$bJoVec4D$Jw0JGPr7YqoExA0GVasdE0
!
service ssh
!
no service telnet
!
service http
!
no clock timezone

...

line con 0
line vty 0 4
!
end
```

Related commands

- [copy running-config](#)
- [show running-config interface](#)
- [show running-config unencrypted](#)

show running-config interface

Overview This command displays the current configuration of one or more interfaces on the device.

You can optionally limit the command output to display only information for a given protocol or feature. The features available depend on your device and will be a subset of the features listed in the table below.

Syntax show running-config interface
 show running-config interface <interface-list>
 show running-config interface <interface-list> <feature>
 show running-config interface <interface-list> ip <feature>
 show running-config interface <interface-list> ipv6 <feature>

Parameter	Description
<interface-list>	The interfaces or ports to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. The specified interfaces must exist.
cfm	Displays running configuration for CFM (Connectivity Fault Management) for the specified interfaces.
dot1x	Displays running configuration for 802.1X port authentication for the specified interfaces.
lacp	Displays running configuration for LACP (Link Aggregation Control Protocol) for the specified interfaces.
ip igmp	Displays running configuration for IGMP (Internet Group Management Protocol) for the specified interfaces.
ip multicast	Displays running configuration for general multicast settings for the specified interfaces.
ip pim sparse-mode	Displays running configuration for PIM-SM (Protocol Independent Multicast - Sparse Mode) for the specified interfaces.
ip pim dense-mode	Displays running configuration for PIM-DM (Protocol Independent Multicasting - Dense Mode) for the specified interfaces.
mstp	Displays running configuration for MSTP (Multiple Spanning Tree Protocol) for the specified interfaces.
ospf	Displays running configuration for OSPF (Open Shortest Path First) for the specified interfaces.

Parameter	Description
rip	Displays running configuration for RIP (Routing Information Protocol) for the specified interfaces.
ipv6 rip	Displays running configuration for RIPng (RIP for IPv6) for the specified interfaces.
ipv6 ospf	Displays running configuration for IPv6 OSPF (Open Shortest Path First) for the specified interfaces.
ipv6 pim sparse-mode	Displays running configuration for PIM-SM (Protocol Independent Multicast - Sparse Mode) for the specified interfaces.
rstp	Displays running configuration for RSTP (Rapid Spanning Tree Protocol) for the specified interfaces.
stp	Displays running configuration for STP (Spanning Tree Protocol) for the specified interfaces.

Mode Privileged Exec and Global Configuration

Default Displays information for all protocols on all interfaces

Examples To display the current running configuration of your device for ports 1 to 4, use the command:

```
awplus# show running-config interface port1.0.1-port1.0.4
```

To display the current running configuration of a device for vlan2, use the command:

```
awplus# show running-config interface vlan2
```

To display the current OSPF configuration of your device for ports 1 to 4, use the command:

```
awplus# show running-config interface port1.0.1-port1.0.4 ospf
```

Output The following shows typical output.

Example output from a show running-config interface eth0 command

```
awplus#show running-config interface eth0
!
interface eth0
 encapsulation dot1q 2
 encapsulation dot1q 3
!
```

Related **copy running-config**
commands **show running-config**

show running-config unencrypted

Overview Use this command to display the running configuration, with passwords in cleartext (unencrypted). Otherwise passwords are displayed in encrypted form. For security reasons, use this command with caution.

This command can only be entered by users who have a privilege level of 15.

Syntax show running-config unencrypted

Mode Privileged Exec

Example To display the running configuration with unencrypted passwords, use the command:

```
awplus# show running-config unencrypted
```

Related commands [show running-config](#)

Command changes Version 5.5.3-2.1: command added

show startup-config

Overview This command displays the contents of the start-up configuration file, which is the file that the device runs on start-up.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show startup-config

Mode Privileged Exec

Example To display the contents of the current start-up configuration file, use the command:

```
awplus# show startup-config
```

Output The following shows typical output.

Example output from the show startup-config command

```
awplus#show startup-config
!
service password-encryption
!
no banner motd
!
username manager privilege 15 password 8 $1$bJoVec4D$Jw0JGPr7YqoExA0GVasdE0
!
service ssh
!
no service telnet
!
service http
!
no clock timezone

...

line con 0
line vty 0 4
!
end
```

Related commands

- [boot config-file backup](#)
- [copy running-config](#)
- [copy startup-config](#)
- [erase startup-config](#)
- [show boot](#)

show version

Overview This command displays the version number and copyright details of the current AlliedWare Plus™ OS your device is running.

Syntax show version

Mode User Exec and Privileged Exec

Example To display the version details of your currently installed software, use the command:

```
awplus# show version
```

Related commands [boot system backup](#)
[show boot](#)

strict-user-process-control

Overview Use this command to enable Strict User Process Control.

Strict User Process Control protects sensitive system resources from modification. It does this by preventing use of:

- some file and directory manipulation commands
- trigger scripting commands
- the **erase factory-default** command.

Use the **no** variant of this command to turn off Strict User Process Control.

Syntax `strict-user-process-control`
`no strict-user-process-control`

Default Disabled.

Mode Global Configuration

Usage notes When you enter the **strict-user-process-control** command, it prompts you for a password. Make the password different from any existing privileged management passwords. Store the password carefully and securely, because you will need it if you want to disable the feature.

In addition, the device will prompt you to save your configuration and reboot. This ensures the change takes effect correctly.

The command must be entered from a physical console; entering it from a remote login session is not allowed for extra security.

You can use the **show running-config** command to confirm whether Strict User Process Control is on or off. If the feature is running the output will contain the command **strict-user-process-control**.

Example To protect sensitive system files from access, use the commands:

```
awplus# configure terminal
awplus(config)# strict-user-process-control
```

Related commands [show running-config](#)
[strict-user-process-control force](#)

Command changes Version 5.5.2-2.1: command added

strict-user-process-control force

Overview Use this command to enable Strict User Process Control permanently, in a way that means it can never be disabled.

Strict User Process Control protects sensitive system resources from modification. It does this by preventing use of:

- some file and directory manipulation commands
- trigger scripting commands
- the **erase factory-default** command.



CAUTION: Only use this command if you have to do so for compliance with specific security certifications. Once you have turned this feature on, you will not be able to remove it.

Syntax `strict-user-process-control force`

Default Disabled.

Mode Global Configuration

Usage notes When you enter this command, the device will prompt you to save your configuration and reboot. This ensures the change takes effect correctly.

Unlike the **strict-user-process-control** command, this **strict-user-process-control force** command enables Strict User Process Control without prompting for or saving a password. This means you cannot disable Strict User Process Control using the **no** variant of the command (or in any other way).

The command must be entered from a physical console; entering it from a remote login session is not allowed for extra security.

You can use the **show running-config** command to confirm whether Strict User Process Control is on or off.

Example To permanently protect sensitive system files from access, use the commands:

```
awplus# configure terminal
awplus(config)# strict-user-process-control force
```

Related commands [show running-config](#)
[strict-user-process-control](#)

Command changes Version 5.5.4-1.8: command added

unmount

Overview Use this command to unmount an external storage device. We recommend you unmount storage devices before removing them, to avoid file corruption. This is especially important if files may be automatically written to the storage device, such as external log files or AMF backup files.

Syntax `unmount usb`

Parameter	Description
usb	Unmount the USB storage device.

Mode Privileged Exec

Example To unmount a USB storage device and safely remove it from the device, use the command:

```
awplus# unmount usb
```

Related commands

- [clear log external](#)
- [log external](#)
- [show file systems](#)
- [show log config](#)
- [show log external](#)

Command changes Version 5.4.7-1.1: command added

write file

Overview This command copies the running-config into the file that is set as the current startup-config file. This command is a synonym of the **write memory** and **copy running-config startup-config** commands.

Syntax write [file]

Mode Privileged Exec

Example To write configuration data to the start-up configuration file, use the command:

```
awplus# write file
```

Related commands **copy running-config**
write memory
show running-config

write memory

Overview This command copies the running-config into the file that is set as the current startup-config file. This command is a synonym of the **write file** and **copy running-config startup-config** commands.

Syntax write [memory]

Mode Privileged Exec

Example To write configuration data to the start-up configuration file, use the command:

```
awplus# write memory
```

Related commands [copy running-config](#)
[write file](#)
[show running-config](#)

write terminal

Overview This command displays the current configuration of the device. This command is a synonym of the **show running-config** command.

Syntax write terminal

Mode Privileged Exec

Example To display the current configuration of your device, use the command:
awplus# write terminal

Related commands **show running-config**

4

User Access Commands

- Contents**
- **Introduction** on page 142
 - **aaa authentication enable default local** on page 143
 - **aaa local authentication attempts logout-time** on page 144
 - **aaa local authentication attempts max-fail** on page 145
 - **aaa login fail-delay** on page 147
 - **clear aaa local user logout** on page 148
 - **clear line console** on page 149
 - **clear line vty** on page 150
 - **enable password** on page 151
 - **enable secret (deprecated)** on page 153
 - **exec-timeout** on page 154
 - **flowcontrol hardware (asyn/console)** on page 156
 - **length (asyn)** on page 158
 - **line** on page 160
 - **privilege level** on page 162
 - **security-password history** on page 163
 - **security-password forced-change** on page 164
 - **security-password lifetime** on page 165
 - **security-password min-lifetime-enforce** on page 166
 - **security-password minimum-categories** on page 168
 - **security-password minimum-length** on page 170
 - **security-password reject-expired-pwd** on page 171
 - **security-password warning** on page 173
 - **service advanced-vty** on page 174
 - **service password-encryption** on page 175
 - **service telnet** on page 176
 - **service terminal-length (deleted)** on page 177
 - **show aaa local user locked** on page 178
 - **show privilege** on page 180
 - **show security-password configuration** on page 181
 - **show security-password user** on page 182
 - **show telnet** on page 183
 - **show users** on page 184
 - **strict-user-process-control** on page 185
 - **strict-user-process-control force** on page 186
 - **telnet** on page 187
 - **telnet server** on page 188

- **terminal length** on page 189
- **terminal resize** on page 190
- **username** on page 191

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure user access.

aaa authentication enable default local

Overview This command enables local privilege level authentication.
Use the **no** variant of this command to disable local privilege level authentication.

Syntax `aaa authentication enable default local`
`no aaa authentication enable default`

Default Local privilege level authentication is enabled by default.

Mode Global Configuration

Usage notes The privilege level configured for a particular user in the local user database is the privilege threshold above which the user is prompted for an **enable (Privileged Exec mode)** command.

Examples To enable local privilege level authentication, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authentication enable default local
```

To disable local privilege level authentication, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa authentication enable default
```

Related commands [aaa authentication login](#)
[enable \(Privileged Exec mode\)](#)
[enable password](#)
[enable secret \(deprecated\)](#)

aaa local authentication attempts lockout-time

Overview This command configures the duration of the user lockout period.

Use the **no** variant of this command to restore the duration of the user lockout period to its default of 300 seconds (5 minutes).

Syntax `aaa local authentication attempts lockout-time <lockout-time>`
`no aaa local authentication attempts lockout-time`

Parameter	Description
<lockout-time>	<0-10000>. Time in seconds to lockout the user.

Mode Global Configuration

Default The default for the lockout-time is 300 seconds (5 minutes).

Usage notes While locked out all attempts to login with the locked account will fail. The lockout can be manually cleared by another privileged account using the **clear aaa local user lockout** command.

Examples To configure the lockout period to 10 minutes (600 seconds), use the commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa local authentication attempts lockout-time 600
```

To restore the default lockout period of 5 minutes (300 seconds), use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa local authentication attempts lockout-time
```

Related commands **aaa local authentication attempts max-fail**
aaa local authentication attempts max-fail remote-login-only
clear aaa local user lockout

aaa local authentication attempts max-fail

Overview This command configures the maximum number of failed login attempts before a user account is locked out. Every time a login attempt fails the failed login counter is incremented.

Use the **no** variant of this command to restore the maximum number of failed login attempts to the default setting (five failed login attempts).

Syntax `aaa local authentication attempts max-fail <failed-logins>`
`no aaa local authentication attempts max-fail`

Parameter	Description
<failed-logins>	<1-32>. Number of login failures allowed before locking out a user.

Mode Global Configuration

Default The default for the maximum number of failed login attempts is five failed login attempts.

Usage When the failed login counter reaches the limit configured by this command that user account is locked out for a specified duration configured by the [aaa local authentication attempts lockout-time](#) command.

When a successful login occurs the failed login counter is reset to 0. When a user account is locked out all attempts to login using that user account will fail.

Examples To configure the number of login failures that will lock out a user account to two login attempts, use the commands:

```
awplus# configure terminal
awplus(config)# aaa local authentication attempts max-fail 2
```

To restore the number of login failures that will lock out a user account to the default number of login attempts (five login attempts), use the commands:

```
awplus# configure terminal
awplus(config)# no aaa local authentication attempts max-fail
```

Related commands **aaa local authentication attempts logout-time**
 aaa local authentication attempts max-fail remote-login-only
 clear aaa local user logout

aaa login fail-delay

Overview Use this command to configure the minimum time period between failed login attempts. This setting applies to login attempts via the console, SSH and Telnet.

Use the **no** variant of this command to reset the minimum time period to its default value.

Syntax `aaa login fail-delay <1-10>`
`no aaa login fail-delay`

Parameter	Description
<1-10>	The minimum number of seconds required between login attempts

Default 1 second

Mode Global configuration

Example To apply a delay of at least 5 seconds between login attempts, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa login fail-delay 5
```

Related commands [aaa authentication login](#)
[aaa local authentication attempts lockout-time](#)
[clear aaa local user lockout](#)

clear aaa local user logout

Overview Use this command to clear the logout on a specific user account or all user accounts.

Syntax clear aaa local user logout {username <username>|all}

Parameter	Description
username	Clear logout for the specified user.
<username>	Specifies the user account.
all	Clear logout for all user accounts.

Mode Privileged Exec

Examples To unlock the user account 'bob' use the following command:

```
awplus# clear aaa local user logout username bob
```

To unlock all user accounts use the following command:

```
awplus# clear aaa local user logout all
```

Related commands [aaa local authentication attempts logout-time](#)

clear line console

Overview This command resets a console line. If a terminal session exists on the line then the terminal session is terminated. If console line settings have changed then the new settings are applied.

Syntax clear line console 0

Mode Privileged Exec

Example To reset the console line (asyn), use the command:

```
awplus# clear line console 0
```

```
% The new settings for console line 0 have been applied
```

Related commands [clear line vty](#)
[flowcontrol hardware \(asyn/console\)](#)
[line](#)
[show users](#)

clear line vty

Overview This command resets a VTY line. If a session exists on the line then it is closed.

Syntax clear line vty <0-32>

Parameter	Description
<0-32>	Line number

Mode Privileged Exec

Example To reset the first VTY line, use the command:

```
awplus# clear line vty 1
```

Related commands

- [privilege level](#)
- [line](#)
- [show telnet](#)
- [show users](#)

enable password

Overview Use this command to set a local password to control access to elevated privilege levels.

Use the **no** version of the command to remove the password.

Note that the **enable secret (deprecated)** command is an outdated alias for the **enable password** command.

Secure mode In secure mode, the **enable password** command allows changing privilege level up to the level configured for the current user, and will require a password if one has been configured for that privilege level.

Syntax enable password [8] <password>
enable password level <1-15> [8] <password>
no enable password [level <1-15>]

Parameter	Description
<password>	The password. The password can be up to 32 characters in length and include characters from up to four categories. The password categories are: • uppercase letters: A to Z • lowercase letters: a to z • digits: 0 to 9 • special symbols: all printable ASCII characters not included in the previous three categories. The question mark ? cannot be used as it is reserved for help functionality.
8	The parameter 8 means that the password that follows is in hashed form, not plain text. Do not type this 8 when creating a password with this command; it is only used in configuration files. In configuration files, the device prints 8 in front of passwords, to indicate that it is displaying the password in its hashed form. Note that the user needs to enter the plain-text version of the password when logging in.
level	Privilege level <1-15>. Level for which the password applies. You can specify up to 16 privilege levels, using numbers 1 through 15. Level 1 is normal EXEC-mode user privileges for User Exec mode. If this argument is not specified in the command or the no variant of the command, the privilege level defaults to 15 (enable mode privileges) for Privileged Exec mode. A privilege level of 7 can be set for intermediate CLI security.

Default Level 15

Mode Global Configuration

Usage notes This command enables the Network Administrator to set a password for entering the Privileged Exec mode when using the **enable (Privileged Exec mode)** command.

You can use this command to give a user an intermediate CLI security level (privilege level 7). Such users can access all the show commands in Privileged Exec mode and all the commands in User Exec mode, but not any configuration commands in Privileged Exec mode.

The device stores passwords in hashed form in configuration files, unless you disable **service password-encryption**.

Related commands

- enable (Privileged Exec mode)**
- enable secret (deprecated)**
- service password-encryption**
- privilege level**
- show privilege**
- username**
- show running-config**

enable secret (deprecated)

Overview This command has been deprecated. It has been replaced by the **enable password** command.

exec-timeout

Overview This command sets the interval your device waits for user input from either a console or VTY connection. Once the timeout interval is reached, the connection is dropped. This command sets the time limit when the console or VTY connection automatically logs off after no activity.

The **no** variant of this command removes a specified timeout and resets to the default timeout (10 minutes).

Syntax `exec-timeout {<minutes>} [<seconds>]`
`no exec-timeout`

Parameter	Description
<minutes>	<0-35791> Required integer timeout value in minutes
<seconds>	<0-2147483> Optional integer timeout value in seconds

Default The default for the `exec-timeout` command is 10 minutes and 0 seconds (`exec-timeout 10 0`).

Mode Line Configuration

Usage notes This command is used set the time the telnet session waits for an idle VTY session, before it times out. An `exec-timeout 0 0` setting will cause the telnet session to wait indefinitely. The command `exec-timeout 0 0` is useful while configuring a device, but reduces device security.

If no input is detected during the interval then the current connection resumes. If no connections exist then the terminal returns to an idle state and disconnects incoming sessions.

Examples To set VTY connections to timeout after 2 minutes, 30 seconds if there is no response from the user, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 32
awplus(config-line)# exec-timeout 2 30
```

To reset the console connection to the default timeout of 10 minutes 0 seconds if there is no response from the user, use the following commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# no exec-timeout
```

Related line
commands **service telnet**
show running-config

flowcontrol hardware (asyn/console)

Overview Use this command to enable RTS/CTS (Ready To Send/Clear To Send) hardware flow control on a terminal console line (asyn port) between the DTE (Data Terminal Equipment) and the DCE (Data Communications Equipment).

Syntax flowcontrol hardware
no flowcontrol hardware

Mode Line Configuration

Default Hardware flow control is disabled by default.

Usage notes Hardware flow control makes use of the RTS and CTS control signals between the DTE and DCE where the rate of transmitted data is faster than the rate of received data. Flow control is a technique for ensuring that a transmitting entity does not overwhelm a receiving entity with data. When the buffers on the receiving device are full, a message is sent to the sending device to suspend the transmission until the data in the buffers has been processed.

Hardware flow control can be configured on terminal console lines (e.g. asyn0). For Reverse Telnet connections, hardware flow control must be configured to match on both the Access Server and the Remote Device. For terminal console sessions, hardware flow control must be configured to match on both the DTE and the DCE. Settings are saved in the running configuration. Changes are applied after reboot, clear line console, or after closing the session.

Use **show running-config** and **show startup-config** commands to view hardware flow control settings that take effect after reboot for a terminal console line. See the **show running-config** command output:

```
awplus#show running-config
!
line con 1
  speed 9600
  mode out 2001
  flowcontrol hardware
!
```

Note that line configuration commands do not take effect immediately. Line configuration commands take effect after one of the following commands or events:

- issuing a clear line console command
- issuing a reboot command
- logging out of the current session

Examples To enable hardware flow control on terminal console line asyn0, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# flowcontrol hardware
```

To disable hardware flow control on terminal console line asyn0, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# no flowcontrol hardware
```

Related commands [clear line console](#)
[show running-config](#)
[speed \(asyn\)](#)

length (asyn)

Overview Use this command to specify the number of rows of output that the device will display before pausing, for the console or VTY line that you are configuring.

The **no** variant of this command restores the length of a line (terminal session) attached to a console port or to a VTY to its default length of 22 rows.

Syntax length <0-512>
no length

Parameter	Description
<0-512>	Number of lines on screen. Specify 0 for no pausing.

Mode Line Configuration

Default The length of a terminal session is 22 rows. The **no length** command restores the default.

Usage notes If the output from a command is longer than the length of the line the output will be paused and the '-More-' prompt allows you to move to the next screen full of data.

A length of 0 will turn off pausing and data will be displayed to the console as long as there is data to display.

Examples To set the terminal session length on the console to 10 rows, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# length 10
```

To reset the terminal session length on the console to the default (22 rows), use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# no length
```

To display output to the console continuously, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# length 0
```

Related [terminal resize](#)
commands [terminal length](#)

line

Overview Use this command to enter line configuration mode for the specified VTYS or the console. The command prompt changes to show that the device is in Line Configuration mode.

Syntax `line vty <first-line> [<last-line>]`
`line console 0`

Parameter	Description
<first-line>	<0-32> Specify the first line number.
<last-line>	<0-32> Specify the last line number.
console	The console terminal line(s) for local access.
vty	Virtual terminal for remote console access.

Mode Global Configuration

Usage notes This command puts you into Line Configuration mode. Once in Line Configuration mode, you can configure console and virtual terminal settings, including setting **speed (asyn)**, **length (asyn)**, **privilege level**, and authentication (**login authentication**) or accounting (**accounting login**) method lists.

To change the console (asyn) port speed, use this **line** command to enter Line Configuration mode before using the **speed (asyn)** command. Set the console speed (Baud rate) to match the transmission rate of the device connected to the console (asyn) port on your device.

Note that line configuration commands do not take effect immediately. Line configuration commands take effect after one of the following commands or events:

- issuing a clear line console command
- issuing a reboot command
- logging out of the current session

Examples To enter Line Configuration mode in order to configure all VTYS, use the commands:

```
awplus# configure terminal
awplus(config)# line vty 0 32
awplus(config-line)#
```

To enter Line Configuration mode to configure the console (asyn 0) port terminal line, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)#
```

Related commands

- accounting login**
- clear line console**
- clear line vty**
- flowcontrol hardware (asyn/console)**
- length (asyn)**
- login authentication**
- privilege level**
- speed (asyn)**

privilege level

Overview This command sets a privilege level for VTY or console connections. The configured privilege level from this command overrides a specific user's initial privilege level at the console login.

Syntax `privilege level <1-15>`

Mode Line Configuration

Usage notes You can set an intermediate CLI security level for a console user with this command by applying privilege level 7 to access all show commands in Privileged Exec and all User Exec commands. However, intermediate CLI security will not show configuration commands in Privileged Exec.

Examples To set the console connection to have the maximum privilege level, use the following commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# privilege level 15
```

To set all VTY connections to have the minimum privilege level, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# privilege level 1
```

To set all VTY connections to have an intermediate CLI security level, to access all show commands, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# privilege level 7
```

Related commands [enable password](#)
[line](#)
[show privilege](#)
[username](#)

security-password history

Overview This command specifies the number of previous passwords that are unable to be reused. A new password is invalid if it matches a password retained in the password history.

The **no** variant of the command disables this feature.

Syntax security-password history <0-15>
no security-password history

Parameter	Description
<0-15>	The allowable range of previous passwords to match against. A value of 0 will disable the history functionality and is equivalent to the no security-password history command. If the history functionality is disabled, all users' password history is reset and all password history is lost.

Default The default history value is 0, which will disable the history functionality.

Mode Global Configuration

Examples To restrict reuse of the three most recent passwords, use the command:

```
awplus# configure terminal
awplus(config)# security-password history 3
```

To allow the reuse of recent passwords, use the command:

```
awplus# configure terminal
awplus(config)# no security-password history
```

Related commands

- [security-password forced-change](#)
- [security-password lifetime](#)
- [security-password min-lifetime-enforce](#)
- [security-password minimum-categories](#)
- [security-password minimum-length](#)
- [security-password reject-expired-pwd](#)
- [security-password warning](#)
- [show running-config security-password](#)
- [show security-password configuration](#)
- [show security-password user](#)

security-password forced-change

Overview This command specifies whether or not a user is forced to change an expired password at the next login. If this feature is enabled, users whose passwords have expired are forced to change to a password that must comply with the current password security rules at the next login.

Note that to use this command, the lifetime feature must be enabled with the **security-password lifetime** command and the reject-expired-pwd feature must be disabled with the **security-password reject-expired-pwd** command.

The **no** variant of the command disables this feature.

Syntax security-password forced-change
no security-password forced-change

Default The forced-change feature is disabled by default.

Mode Global Configuration

Example To force a user to change their expired password at the next login, use the command:

```
awplus# configure terminal
awplus(config)# security-password forced-change
```

Related commands

- security-password history**
- security-password lifetime**
- security-password min-lifetime-enforce**
- security-password minimum-categories**
- security-password minimum-length**
- security-password reject-expired-pwd**
- security-password warning**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

security-password lifetime

Overview This command enables password expiry by specifying a password lifetime in days.

Note that when the password lifetime feature is disabled, it also disables the **security-password forced-change** command and the **security-password warning** command.

The **no** variant of the command disables this feature.

Syntax security-password lifetime <0-1000>
no security-password lifetime

Parameter	Description
<0-1000>	Password lifetime specified in days. A value of 0 will disable lifetime functionality and the password will never expire. This is equivalent to the no security-password lifetime command.

Default The default password lifetime is 0, which will disable the lifetime functionality.

Mode Global Configuration

Example To configure the password lifetime to 10 days, use the command:

```
awplus# configure terminal
awplus(config)# security-password lifetime 10
```

Related commands

- security-password forced-change**
- security-password history**
- security-password min-lifetime-enforce**
- security-password minimum-categories**
- security-password minimum-length**
- security-password reject-expired-pwd**
- security-password warning**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

security-password min-lifetime-enforce

Overview Use this command to configure a minimum number of days before a password can be changed by a user. With this feature enabled, once a user sets the password, the user cannot change it again until the minimum lifetime has passed.

Use the **no** variant of this command to remove the minimum lifetime.

Syntax security-password min-lifetime-enforce <0-1000>
no security-password min-lifetime-enforce

Parameter	Description
<0-1000>	The minimum number of days before a password can be changed

Default By default, no minimum lifetime is enforced.

Mode Global Configuration

Usage notes The minimum lifetime is helpful in conjunction with a security policy that prevents people from re-using old passwords. For example, if you do not allow people to re-use any of their last 5 passwords, a person can bypass that restriction by changing their password 5 times in quick succession and then re-setting it to their previous password. The minimum lifetime prevents that by preventing people from changing their password in quick succession.

Example To force users to wait at least 2 days between changing passwords, use the command:

```
awplus(config)# security-password min-lifetime-enforce 2
```

Related commands

- security-password forced-change**
- security-password history**
- security-password lifetime**
- security-password minimum-categories**
- security-password minimum-length**
- security-password reject-expired-pwd**
- security-password warning**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

Command changes Version 5.4.7-0.2: command added

security-password minimum-categories

Overview This command specifies the minimum number of categories that the password must contain in order to be considered valid. The password categories are:

- uppercase letters: A to Z
- lowercase letters: a to z
- digits: 0 to 9
- special symbols: all printable ASCII characters not included in the previous three categories. The question mark (?) cannot be used as it is reserved for help functionality.

Note that to ensure password security, the minimum number of categories should align with the lifetime selected, i.e. the fewer categories specified the shorter the lifetime specified.

Syntax security-password minimum-categories <1-4>

Parameter	Description
<1-4>	Number of categories the password must satisfy, in the range 1 to 4.

Default The default number of categories that the password must satisfy is 1.

Mode Global Configuration

Example To configure the required minimum number of character categories to be 3, use the command:

```
awplus# configure terminal
awplus(config)# security-password minimum-categories 3
```

Related commands

- security-password forced-change**
- security-password history**
- security-password lifetime**
- security-password min-lifetime-enforce**
- security-password minimum-length**
- security-password reject-expired-pwd**
- security-password warning**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

security-password minimum-length

Overview This command specifies the minimum allowable password length. This value is checked against when there is a password change or a user account is created.

Syntax security-password minimum-length <1-23>

Parameter	Description
<1-23>	Minimum password length in the range from 1 to 23.

Default The default minimum password length is 1.

Mode Global Configuration

Example To configure the required minimum password length as 8, use the command:

```
awplus# configure terminal
awplus(config)# security-password minimum-length 8
```

Related commands

- [security-password forced-change](#)
- [security-password history](#)
- [security-password lifetime](#)
- [security-password min-lifetime-enforce](#)
- [security-password minimum-categories](#)
- [security-password reject-expired-pwd](#)
- [security-password warning](#)
- [show running-config security-password](#)
- [show security-password configuration](#)
- [show security-password user](#)

security-password reject-expired-pwd

Overview This command specifies whether or not a user is allowed to login with an expired password. Users with expired passwords are rejected at login if this functionality is enabled. Users then have to contact the Network Administrator to change their password.



CAUTION: *Once all users' passwords are expired you are unable to login to the device again if the security-password reject-expired-pwd command has been executed. You will have to reboot the device with a default configuration file, or load an earlier software version that does not have the security password feature.*

We recommend you never have the command line "security-password reject-expired-pwd" in a default config file.

Note that when the reject-expired-pwd functionality is disabled and a user logs on with an expired password, if the forced-change feature is enabled with **security-password forced-change** command, a user may have to change the password during login depending on the password lifetime specified by the **security-password lifetime** command.

The **no** variant of the command disables this feature.

Syntax security-password reject-expired-pwd
no security-password reject-expired-pwd

Default The reject-expired-pwd feature is disabled by default.

Mode Global Configuration

Example To configure the system to reject users with an expired password, use the command:

```
awplus# configure terminal
awplus(config)# security-password reject-expired-pwd
```

Related commands

- security-password forced-change**
- security-password history**
- security-password lifetime**
- security-password min-lifetime-enforce**
- security-password minimum-categories**
- security-password minimum-length**
- security-password warning**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

security-password warning

Overview This command specifies the number of days before the password expires that the user will receive a warning message specifying the remaining lifetime of the password.

Note that the warning period cannot be set unless the lifetime feature is enabled with the **security-password lifetime** command.

The **no** variant of the command disables this feature.

Syntax security-password warning <0-1000>
no security-password warning

Parameter	Description
<0-1000>	Warning period in the range from 0 to 1000 days. A value 0 disables the warning functionality and no warning message is displayed for expiring passwords. This is equivalent to the no security-password warning command. The warning period must be less than, or equal to, the password lifetime set with the security-password lifetime command.

Default The default warning period is 0, which disables warning functionality.

Mode Global Configuration

Example To configure a warning period of three days, use the command:

```
awplus# configure terminal
awplus(config)# security-password warning 3
```

Related commands

- security-password forced-change**
- security-password history**
- security-password lifetime**
- security-password min-lifetime-enforce**
- security-password minimum-categories**
- security-password minimum-length**
- security-password reject-expired-pwd**
- show running-config security-password**
- show security-password configuration**
- show security-password user**

service advanced-vty

Overview This command enables the advanced-vty help feature. This allows you to use TAB completion for commands. Where multiple options are possible, the help feature displays the possible options.

The **no service advanced-vty** command disables the advanced-vty help feature.

Syntax service advanced-vty
no service advanced-vty

Default The advanced-vty help feature is enabled by default.

Mode Global Configuration

Examples To disable the advanced-vty help feature, use the command:

```
awplus# configure terminal
awplus(config)# no service advanced-vty
```

To re-enable the advanced-vty help feature after it has been disabled, use the following commands:

```
awplus# configure terminal
awplus(config)# service advanced-vty
```

service password-encryption

Overview Use this command to enable password encryption. This is enabled by default. When password encryption is enabled, the device displays passwords in the running config in encrypted form instead of in plain text.

Use the **no service password-encryption** command to stop the device from displaying newly-entered passwords in encrypted form. This does not change the display of existing passwords.

Syntax service password-encryption
no service password-encryption

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# service password-encryption

Validation show running-config
Commands

Related enable password
commands

service telnet

Overview Use this command to enable the telnet server. The server is disabled by default. Enabling the telnet server starts the device listening for incoming telnet sessions on the configured port.

The server listens on port 23, unless you have changed the port by using the **privilege level** command.

Use the **no** variant of this command to disable the telnet server. Disabling the telnet server will stop the device listening for new incoming telnet sessions. However, existing telnet sessions will still be active.

Syntax service telnet [ip|ipv6]
no service telnet [ip|ipv6]

Default The IPv4 and IPv6 telnet servers are disabled by default.
The configured telnet port is TCP port 23 by default.

Mode Global Configuration

Examples To enable both the IPv4 and IPv6 telnet servers, use the following commands:

```
awplus# configure terminal  
awplus(config)# service telnet
```

To enable the IPv6 telnet server only, use the following commands:

```
awplus# configure terminal  
awplus(config)# service telnet ipv6
```

To disable both the IPv4 and IPv6 telnet servers, use the following commands:

```
awplus# configure terminal  
awplus(config)# no service telnet
```

To disable the IPv6 telnet server only, use the following commands:

```
awplus# configure terminal  
awplus(config)# no service telnet ipv6
```

Related commands [clear line vty](#)
[show telnet](#)
[telnet server](#)

Command changes Version 5.5.5-2.1: Disabled by default

service terminal-length (deleted)

Overview This command has been deleted in Software Version 5.4.5-0.1 and later.

show aaa local user locked

Overview This command displays the failed attempts against each user account attempting to login into the device, along with the failure times and locations.

Use this command's output to see if a user is currently locked out or not. You can check:

- the number of login attempts that have a 'V' in the 'Valid' column, and
- if the last attempt happened within the lockout time. If the number of 'V' attempts exceeds the maximum allowed number of attempts, and the last attempt is within the lockout time, then the user is locked out.

The maximum number of attempts is 5 by default. You can change it using the command **aaa local authentication attempts max-fail**.

The lockout time is 5 minutes by default. You can change it using the command **aaa local authentication attempts lockout-time**.

Once a user's lockout status is cleared, this command will no longer display any failed attempts for that user. The status gets cleared by:

- being manually cleared by another privileged user, using the **clear aaa local user lockout** command, or
- the locked out user successfully logs into the system after waiting for the lockout time to pass.

In the Valid column:

- 'V' means this login attempt counts towards the maximum allowed number of attempts
- 'I' means this login attempt does not count towards the maximum allowed number of attempts, because it was more than 15 minutes ago.

Syntax show aaa local user locked

Mode User Exec and Privileged Exec

Example To display the current failed attempts for local users, use the command:

```
awplus# show aaa local user locked
```

Output The following shows typical output.

Example output from the show aaa local user locked command

```
awplus#show aaa local user locked
manager:
When                Type  Source                Valid
2023-02-09 11:48:15 RHOST 192.168.5.1          V
2023-02-09 11:48:21 RHOST 192.168.5.1          V
user1:
When                Type  Source                Valid
2023-02-09 11:47:28 RHOST 192.168.5.1          V
2023-02-09 11:47:31 TTY   /dev/ttyS0           V
2023-02-09 11:47:35 TTY   /dev/ttyS0           V
2023-02-09 11:47:38 RHOST 192.168.5.1          V
2023-02-09 11:47:49 RHOST 192.168.5.1          V
2023-02-09 11:20:50 TTY   /dev/ttyS0           I
2023-02-09 11:20:54 RHOST 192.168.5.1          I
2023-02-09 11:47:19 RHOST 192.168.5.1          V
2023-02-09 11:47:23 TTY   /dev/ttyS0           V
user2:
When                Type  Source                Valid
2023-02-09 11:47:52 TTY   /dev/ttyS0           V
2023-02-09 11:47:55 RHOST 192.168.5.1          V
2023-02-09 11:47:58 TTY   /dev/ttyS0           V
2023-02-09 11:48:05 RHOST 192.168.5.1          V
2023-02-09 11:22:51 RHOST 192.168.5.1          I
2023-02-09 11:22:54 TTY   /dev/ttyS0           I
user3:
When                Type  Source                Valid
2023-02-09 11:38:58 TTY   /dev/ttyS0           V
2023-02-09 11:39:04 RHOST 192.168.5.1          V
2023-02-09 11:39:06 TTY   /dev/ttyS0           V
2023-02-09 11:39:22 RHOST 192.168.5.1          V
2023-02-09 11:39:26 TTY   /dev/ttyS0           V
```

This output example was run at 11:49. The lockout-time and max-fail settings are set to their defaults:

- manager: is not locked out because they only have 2 valid attempts.
- user1: is locked out because they have 7 valid attempts and the most recent was within the lockout time.
- user2: is not locked out because only 4 attempts are valid.
- user3: is not locked out. Even though they have 5 valid attempts, the most recent attempt is older than the lockout time of 5 minutes.

Related commands [aaa local authentication attempts lockout-time](#)
[aaa local authentication attempts max-fail](#)
[clear aaa local user lockout](#)

show privilege

Overview This command displays the current user privilege level, which can be any privilege level in the range <1-15>. Privilege levels <1-6> allow limited user access (all User Exec commands), privilege levels <7-14> allow restricted user access (all User Exec commands plus Privileged Exec show commands). Privilege level 15 gives full user access to all Privileged Exec commands.

Syntax show privilege

Mode User Exec and Privileged Exec

Usage notes A user can have an intermediate CLI security level set with this command for privilege levels <7-14> to access all show commands in Privileged Exec mode and all commands in User Exec mode, but no configuration commands in Privileged Exec mode.

Example To show the current privilege level of the user, use the command:
awplus# show privilege

Output The following shows typical output.

Example output from the show privilege command

```
awplus#show privilege
Current privilege level is 15
awplus#disable
awplus>show privilege
Current privilege level is 1
```

Related commands [privilege level](#)

show security-password configuration

Overview This command displays the configuration settings for the various security password rules.

Syntax show security-password configuration

Mode Privileged Exec

Example To display the current security-password rule configuration settings, use the command:

```
awplus# show security-password configuration
```

Output The following shows typical output.

Example output from the show security-password configuration command

```
Security Password Configuration
Minimum password length ..... 8
Minimum password character categories to match ..... 3
Number of previously used passwords to restrict..... 4
Password lifetime ..... 30 day(s)
  Warning period before password expires ..... 3 day(s)
Reject expired password at login ..... Disabled
Force changing expired password at login ..... Enabled
```

Related commands

- [security-password forced-change](#)
- [security-password history](#)
- [security-password lifetime](#)
- [security-password min-lifetime-enforce](#)
- [security-password minimum-categories](#)
- [security-password minimum-length](#)
- [security-password reject-expired-pwd](#)
- [security-password warning](#)
- [show security-password user](#)

show security-password user

Overview This command displays user account and password information for all users.

Syntax show security-password user

Mode Privileged Exec

Example To display the system users' remaining lifetime or last password change, use the command:

```
awplus# show security-password user
```

Output The following shows typical output.

Example output from the show security-password user command

User account and password information			
UserName	Privilege	Last-PWD-Change	Remaining-lifetime

manager	15	4625 day(s) ago	No Expiry
bob15	15	0 day(s) ago	30 days
ted7	7	0 day(s) ago	No Expiry
mike1	1	0 day(s) ago	No Expiry

Related commands

- [security-password forced-change](#)
- [security-password history](#)
- [security-password lifetime](#)
- [security-password min-lifetime-enforce](#)
- [security-password minimum-categories](#)
- [security-password minimum-length](#)
- [security-password reject-expired-pwd](#)
- [security-password warning](#)
- [show security-password configuration](#)

show telnet

Overview This command shows the Telnet server settings.

Syntax show telnet

Mode User Exec and Privileged Exec

Example To show the Telnet server settings, use the command:

```
awplus# show telnet
```

Output The following shows typical output.

Example output from the show telnet command

```
Telnet Server Configuration
-----
Telnet server           : Enabled
Protocol                : IPv4, IPv6
Port                    : 23
```

Related commands

- [clear line vty](#)
- [service telnet](#)
- [show users](#)
- [telnet server](#)

show users

Overview This command shows information about the users who are currently logged into the device.

Syntax show users

Mode User Exec and Privileged Exec

Example To show the users currently connected to the device, use the command:
awplus# show users

Output The following shows typical output.

Example output from the show users command

Line	User	Host(s)	Idle	Location	Priv	Idletime	Timeout
con 0	manager	idle	00:00:00	ttyS0	15	10	N/A
vty 0	bob	idle	00:00:03	172.16.11.3	1	0	5

Parameters in the output of the show users command

Parameter	Description
Line	Console port user is connected to.
User	Login name of user.
Host(s)	Status of the host the user is connected to.
Idle	How long the host has been idle.
Location	URL location of user.
Priv	The privilege level in the range 1 to 15, with 15 being the highest.
Idletime	The time interval the device waits for user input from either a console or VTY connection.
Timeout	The time interval before a server is considered unreachable.

strict-user-process-control

Overview Use this command to enable Strict User Process Control.

Strict User Process Control protects sensitive system resources from modification. It does this by preventing use of:

- some file and directory manipulation commands
- trigger scripting commands
- the **erase factory-default** command.

Use the **no** variant of this command to turn off Strict User Process Control.

Syntax `strict-user-process-control`
`no strict-user-process-control`

Default Disabled.

Mode Global Configuration

Usage notes When you enter the **strict-user-process-control** command, it prompts you for a password. Make the password different from any existing privileged management passwords. Store the password carefully and securely, because you will need it if you want to disable the feature.

In addition, the device will prompt you to save your configuration and reboot. This ensures the change takes effect correctly.

The command must be entered from a physical console; entering it from a remote login session is not allowed for extra security.

You can use the **show running-config** command to confirm whether Strict User Process Control is on or off. If the feature is running the output will contain the command **strict-user-process-control**.

Example To protect sensitive system files from access, use the commands:

```
awplus# configure terminal
awplus(config)# strict-user-process-control
```

Related commands [show running-config](#)
[strict-user-process-control force](#)

Command changes Version 5.5.2-2.1: command added

strict-user-process-control force

Overview Use this command to enable Strict User Process Control permanently, in a way that means it can never be disabled.

Strict User Process Control protects sensitive system resources from modification. It does this by preventing use of:

- some file and directory manipulation commands
- trigger scripting commands
- the **erase factory-default** command.



CAUTION: Only use this command if you have to do so for compliance with specific security certifications. Once you have turned this feature on, you will not be able to remove it.

Syntax `strict-user-process-control force`

Default Disabled.

Mode Global Configuration

Usage notes When you enter this command, the device will prompt you to save your configuration and reboot. This ensures the change takes effect correctly.

Unlike the **strict-user-process-control** command, this **strict-user-process-control force** command enables Strict User Process Control without prompting for or saving a password. This means you cannot disable Strict User Process Control using the **no** variant of the command (or in any other way).

The command must be entered from a physical console; entering it from a remote login session is not allowed for extra security.

You can use the **show running-config** command to confirm whether Strict User Process Control is on or off.

Example To permanently protect sensitive system files from access, use the commands:

```
awplus# configure terminal
awplus(config)# strict-user-process-control force
```

Related commands [show running-config](#)
[strict-user-process-control](#)

Command changes Version 5.5.4-1.8: command added

telnet

Overview Use this command to open a telnet session to a remote device.

Syntax `telnet {<hostname>|[ip] <ipv4-addr>|[ipv6] <ipv6-addr>} [<port>]`

Parameter	Description
<hostname>	The host name of the remote system.
ip	Keyword used to specify the IPv4 address or host name of a remote system.
<ipv4-addr>	An IPv4 address of the remote system.
ipv6	Keyword used to specify the IPv6 address of a remote system
<ipv6-addr>	Placeholder for an IPv6 address in the format x:x::x:x, for example, 2001:db8::8a2e:7334
<port>	Specify a TCP port number (well known ports are in the range 1- 1023, registered ports are 1024-49151, and private ports are 49152- 65535).

Mode User Exec and Privileged Exec

Examples To connect to TCP port 2602 on the device at 10.2.2.2, use the command:

```
awplus# telnet 10.2.2.2 2602
```

To connect to the telnet server host .example, use the command:

```
awplus# telnet host.example
```

To connect to the telnet server host .example on TCP port 100, use the command:

```
awplus# telnet host.example 100
```

telnet server

Overview This command enables the telnet server on the specified TCP port. If the server is already enabled then it will be restarted on the new port. Changing the port number does not affect the port used by existing sessions.

Syntax telnet server {<1-65535>|default}

Parameter	Description
<1-65535>	The TCP port to listen on.
default	Use the default TCP port number 23.

Mode Global Configuration

Example To enable the telnet server on TCP port 2323, use the following commands:

```
awplus# configure terminal
awplus(config)# telnet server 2323
```

Related commands [show telnet](#)

terminal length

Overview Use the **terminal length** command to specify the number of rows of output that the device will display before pausing, for the currently-active terminal only.

Use the **terminal no length** command to remove the length specified by this command. The default length will apply unless you have changed the length for some or all lines by using the **length (asyn)**.

Syntax `terminal length <length>`
`terminal no length [<length>]`

Parameter	Description
<length>	<0-512> Number of rows that the device will display on the currently-active terminal before pausing.

Mode User Exec and Privileged Exec

Examples The following example sets the number of lines to 15:

```
awplus# terminal length 15
```

The following example removes terminal length set previously:

```
awplus# terminal no length
```

Related commands `terminal resize`
length (asyn)

terminal resize

Overview Use this command to automatically adjust the number of rows of output on the console, which the device will display before pausing, to the number of rows configured on the user's terminal.

Syntax `terminal resize`

Mode User Exec and Privileged Exec

Usage notes When the user's terminal size is changed, then a remote session via SSH or TELNET adjusts the terminal size automatically. However, this cannot normally be done automatically for a serial or console port. This command automatically adjusts the terminal size for a serial or console port.

Examples The following example automatically adjusts the number of rows shown on the console:

```
awplus# terminal resize
```

Related commands [length \(asyn\)](#)
[terminal length](#)

username

Overview This command creates or modifies a user to assign a privilege level and a password.

NOTE: *The default username privilege level of 1 is not shown in running-config output. Any username privilege level that has been modified from the default is shown.*

Syntax username <name> privilege <1-15> [password [8] <password>]
 username <name> password [8] <password>
 no username <name>

Parameter	Description		
<name>	The login name for the user. The user name can contain alphanumeric ASCII characters, plus signs (ASCII 43), dashes (ASCII 45), dots (ASCII 46), @ signs (ASCII 64), slashes (ASCII 47), backslashes (ASCII 92), and underscores (ASCII 95). It cannot contain spaces. It must not start with a digit, a plus sign, a dash or an @ sign. It must not end with an @ sign. On the AlliedWare Plus CLI, it is case sensitive. It cannot contain question marks (?), spaces (), or single or double quote characters.		
privilege	The user's privilege level. Use the privilege levels to set the access rights for each user. <table> <tr> <td><1-15></td><td> A privilege level: either 1-14 (limited access) or 15 (full access). A user with privilege level 1-14 can only access higher privilege levels if an enable password has been configured for the level the user tries to access and the user enters that password. A user at privilege level 1 can access the majority of show commands. A user at privilege level 7 can access the majority of show commands including platform show commands. Privilege Level 15 (to access the Privileged Exec command mode) is required to access configuration commands as well as show commands in Privileged Exec. </td></tr> </table>	<1-15>	A privilege level: either 1-14 (limited access) or 15 (full access). A user with privilege level 1-14 can only access higher privilege levels if an enable password has been configured for the level the user tries to access and the user enters that password. A user at privilege level 1 can access the majority of show commands. A user at privilege level 7 can access the majority of show commands including platform show commands. Privilege Level 15 (to access the Privileged Exec command mode) is required to access configuration commands as well as show commands in Privileged Exec.
<1-15>	A privilege level: either 1-14 (limited access) or 15 (full access). A user with privilege level 1-14 can only access higher privilege levels if an enable password has been configured for the level the user tries to access and the user enters that password. A user at privilege level 1 can access the majority of show commands. A user at privilege level 7 can access the majority of show commands including platform show commands. Privilege Level 15 (to access the Privileged Exec command mode) is required to access configuration commands as well as show commands in Privileged Exec.		
password	A password that the user must enter when logging in. <table> <tr> <td>8</td><td> The parameter 8 means that the password that follows is in hashed form, not plain text. Do not type this 8 when creating a password with this command; it is only used in configuration files. In configuration files, the device prints 8 in front of passwords, to indicate that it is displaying the password in its hashed form. </td></tr> </table>	8	The parameter 8 means that the password that follows is in hashed form, not plain text. Do not type this 8 when creating a password with this command; it is only used in configuration files. In configuration files, the device prints 8 in front of passwords, to indicate that it is displaying the password in its hashed form.
8	The parameter 8 means that the password that follows is in hashed form, not plain text. Do not type this 8 when creating a password with this command; it is only used in configuration files. In configuration files, the device prints 8 in front of passwords, to indicate that it is displaying the password in its hashed form.		

Parameter	Description
	Note that the user needs to enter the plain-text version of the password when logging in.
<code><password></code>	The user's password. The password can be up to 32 characters in length and include characters from up to four categories. The password categories are: • uppercase letters: A to Z • lowercase letters: a to z • digits: 0 to 9 • special symbols: all printable ASCII characters not included in the previous three categories. The question mark ? cannot be used as it is reserved for help functionality.

Mode Global Configuration

Default The privilege level is 1 by default. Note the default is not shown in running-config output.

Usage notes An intermediate CLI security level (privilege level 7 to privilege level 14) allows a CLI user access to the majority of show commands, including the platform show commands that are available at privilege level 1 to privilege level 6. Note that some show commands, such as **show running-configuration** and **show startup-configuration**, are only available at privilege level 15.

Examples To create the user "bob" with a privilege level of 15, for all show commands including show running-configuration and show startup-configuration and to access configuration commands in Privileged Exec command mode, and the password "bobs_secret", use the commands:

```
awplus# configure terminal
```

```
awplus(config)# username bob privilege 15 password bobs_secret
```

To create a user "junior_admin" with a privilege level of 7, which will have intermediate CLI security level access for most show commands, and the password "show_only", use the commands:

```
awplus# configure terminal
```

```
awplus(config)# username junior_admin privilege 7 password  
show_only
```

Related commands **enable password**
 security-password minimum-categories
 security-password minimum-length

5

Feature Licensing Commands

- Contents**
- **Introduction** on page 196
 - **license** on page 197
 - **show license** on page 199
 - **show license brief** on page 201

Introduction

Overview This chapter provides an alphabetical reference for each of the Feature Licensing commands. Feature Licensing enables you to use advanced features such as Layer 3 routing.

NOTE: *crypto secure-mode*

To see which Feature Licenses are available for your device, see the [AlliedWare Plus Datasheet](#).

Allied Telesis Management Framework (AMF) requires a Subscription License. For information about Subscription Licensing commands, see the Subscription Licensing Commands chapter.

For step-by-step instructions about how to license AlliedWare Plus devices, see the [Licensing Feature Overview and Configuration_Guide](#).

license

Overview This command activates the licensed software feature set on a device.

Use the **no** variant of this command to deactivate the licensed software feature set on a device.

For feature licenses, contact your authorized distributor or reseller. If a license key expires or is incorrect so the license key is invalid, then some software features will be unavailable.

NOTE: See the AlliedWare Plus™ datasheet for a list of current feature licenses available by product. Purchase licenses from your authorized dealer or reseller.

NOTE: The command is not available in Secure Mode (see the command.

In a live network, only install feature licenses during scheduled maintenance. For example, if a feature license includes EPSR, installing that license will cause EPSR to be restarted with a temporary loss of EPSR network traffic.

Syntax license <label> <key>
no license <label>

Parameter	Description
<label>	A name for the feature license. To determine names already in use, use the show license command. This can be the default name supplied for the feature, or a renamed feature name.
<key>	The encrypted license key to enable a set of software features.

Mode Privileged Exec

Usage notes You can change the license label using this command to make it specific to you when you initially add a license. Once a license is added, any change to the license label first requires removal of the license before adding a license again with a new license label.

The default feature license labels are issued along with encrypted license keys by e-mail for you to apply using this command to activate features. You can change default feature license labels, but they must be 15 characters or less.

For example, you may want to change the label of the premium license to "premium-license". You can check your new license label by using the **show license** command.

If you add a feature license you will be prompted at the console that the feature needs to restart. Restarting of individual protocols in this manner could result in the loss of network traffic. Only install licenses in scheduled maintenance periods for devices in a live environment.

For example, if the feature license contains a license for the EPSR protocol, then that protocol will restart, but you do not need to manually restart the whole device for the new license to take effect.

Examples To activate the license called "Premium" that has the key 12345678ABCDE123456789ABCDE, use the command:

```
awplus# license Premium 12345678ABCDE123456789ABCDE
```

To deactivate the license called "Premium", use the command:

```
awplus# no license Premium
```

Related commands **show license**

show license

Overview This command displays information about a specific software feature license, or all enabled software feature licenses on the device.

Syntax `show license [feature] [<label>|index <index-number>]`

Parameter	Description
feature	Only display license information for any applied feature licenses.
<label>	The license name to show information about. This can be used instead of the index number to identify a specific license.
index <index-number>	The index number of the license to show information about. This can be used instead of the license name to identify a specific license.

Mode User Exec and Privileged Exec

Examples To display full information about all enabled licenses, use the command:

```
awplus# show license
```

To display full information about the licenses with index number 1, use the command:

```
awplus# show license index 1
```

Output The following shows typical output.

Example output from show license

```
awplus#show license
Board region: Global
Software Licenses
-----
Index                : 1
License name         : Base License
Customer name        : Base License
Quantity of licenses : 1
Type of license       : Full
License issue date    : 20-Mar-2019
License expiry date   : N/A
Features included     : IPv6Basic, LAG-FULL, MLDSnoop, RADIUS-100, ...
```

Parameters in the output of show license

Parameter	Description
Board region	Name of the region for the Base License features.
Index	Index identifying entry. The index is assigned automatically by the software. It is not configured.
License name	Name of the license key bundle (case-sensitive).
Customer name	Customer name.
Quantity of licenses	Quantity of licensed installations.
Type of license	Full or Trial.
License issue date	Date the license was generated.
License expiry date	Expiry date for trial license.
Features included	List of features included in the feature license.

Related commands [license](#)
[show license brief](#)

show license brief

Overview This command displays information about a specific software feature license, or all enabled software feature licenses on the device.

Syntax show license brief
show license [feature] [<label>|index <index-number>] brief

Parameter	Description
feature	Only display license information for any applied feature licenses.
<label>	The license name to show information about. This can be used instead of the index number to identify a specific license.
index <index-number>	The index number of the license to show information about. This can be used instead of the license name to identify a specific license.
brief	Displays a brief summary of license information.

Mode User Exec and Privileged Exec

Examples To display a brief summary of information about all licenses, use the command:

```
awplus# show license brief
```

Output The following shows typical output.

Example output from show license brief

```
awplus#show license brief
Board region: Global
Software Licenses
-----
Index License name      Quantity  Customer name
   Type              Version    Period
-----
  1   Base License      1         Base License
     Full                      N/A

Current enabled features for displayed licenses:
IPv6Basic, LAG-FULL, MLDSnoop ...
```

Parameters in the output of show license brief

Parameter	Description
Board region	Name of the region for the Base License features.
Index	Index identifying entry. The index is assigned automatically by the software. It is not configured.
License name	Name of the license key bundle (case-sensitive).
Quantity	Quantity of licensed installations.
Customer name	Customer name.
Type	Full or Trial.
Period	Expiry date for trial license.
Current enabled features for displayed licenses	List of features included in the license.

Related **license**
commands **show license**

6

System Configuration and Monitoring Commands

- Contents**
- **Introduction** on page 205
 - **banner display external-manager** on page 206
 - **banner exec** on page 207
 - **banner external-manager** on page 209
 - **banner login (system)** on page 211
 - **banner motd** on page 212
 - **clock set** on page 214
 - **clock summer-time date** on page 215
 - **clock summer-time recurring** on page 217
 - **clock timezone** on page 220
 - **continuous-reboot-prevention** on page 221
 - **crypto secure-mode** on page 223
 - **debug core-file** on page 224
 - **ecofriendly led** on page 225
 - **ecofriendly lpi** on page 226
 - **findme** on page 228
 - **findme trigger** on page 230
 - **hostname** on page 231
 - **low-memory restart** on page 233
 - **max-fib-routes** on page 234
 - **max-static-routes** on page 235
 - **no debug all** on page 236
 - **reboot** on page 238
 - **reload** on page 239
 - **show banner external-manager** on page 240
 - **show clock** on page 241
 - **show continuous-reboot-prevention** on page 243
 - **show cpu** on page 244
 - **show cpu history** on page 247
 - **show debugging** on page 249
 - **show ecofriendly** on page 250
 - **show interface memory** on page 252
 - **show memory** on page 254
 - **show memory allocations** on page 257
 - **show memory history** on page 259
 - **show memory pools** on page 260
 - **show memory shared** on page 261

- **show process** on page 262
- **show reboot history** on page 265
- **show router-id** on page 267
- **show secure-mode** on page 268
- **show system** on page 269
- **show system environment** on page 270
- **show system environment counters** on page 272
- **show system interrupts** on page 275
- **show system mac** on page 276
- **show system pci device** on page 277
- **show system pci tree** on page 278
- **show system psu config** on page 279
- **show system serialnumber** on page 280
- **show tech-support** on page 281
- **speed (asyn)** on page 284
- **system psu unused** on page 286
- **terminal monitor** on page 288
- **undebg all** on page 289

Introduction

Overview This chapter provides an alphabetical reference of commands for configuring and monitoring the system.

banner display external-manager

Overview Use this command to display the external-manager banner. The external-manager banner warns you that certain features are being managed by an external management system. For example, if you are using Vista Manager EX to manage your network, you will see a notification banner telling you what features are being managed after you enter Global Configuration Mode.

Use the **no** variant of this command to hide the external-manager banner.

Syntax banner display external-manager
no banner display external-manager

Default The external-manager banner is displayed by default.

Mode User Exec

Usage notes The external-manager banner is displayed by default. In some instances it is desirable to hide it for the current session. You do this by using the **no** variant of this command. The banner will remain hidden until you either re-enable it, or log out and then log back in.

Example To hide the external-manager banner, use the command:

```
awplus> no banner display external-manager
```

To display the external-manager banner, use the command:

```
awplus> banner display external-manager
```

Related commands [banner external-manager](#)
[show banner external-manager](#)

Command changes Version 5.5.1-1.1: command added

banner exec

Overview This command configures the User Exec mode banner that is displayed on the console after you login. The **banner exec default** command restores the User Exec banner to the default banner. Use the **no banner exec** command to disable the User Exec banner and remove the default User Exec banner.

Syntax `banner exec <banner-text>`
`banner exec default`
`no banner exec`

Default By default, the AlliedWare Plus™ version and build date is displayed at console login, such as:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

Mode Global Configuration

Examples To configure a User Exec mode banner after login (in this example, to tell people to use the **enable** command to move to Privileged Exec mode), enter the following commands:

```
awplus#configure terminal
awplus(config)#banner exec Use enable to move to Priv Exec mode
awplus(config)#exit
awplus#exit

awplus login: manager
Password:

Use enable to move to Priv Exec mode

awplus>
```

To restore the default User Exec mode banner after login, enter the following commands:

```
awplus#configure terminal
awplus(config)#banner exec default
awplus(config)#exit
awplus#exit

awplus login: manager
Password:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

awplus>
```

To remove the User Exec mode banner after login, enter the following commands:

```
awplus#configure terminal
awplus(config)#no banner exec
awplus(config)#exit
awplus#exit

awplus login: manager
Password:

awplus>
```

Related commands [banner login \(system\)](#)
[banner motd](#)

banner external-manager

Overview Use this command to add an entry to the external-manager banner. The external-manager banner warns you that certain features are being managed by an external management system. For example, if you are using Vista Manager EX to manage your network, you will see a notification banner telling you what features are being managed after you enter Global Configuration Mode.

Use the **no** variant to remove an entry from the external-manager banner.

Syntax `banner external-manager <manager-name> feature <feature-name> note <feature-note>`
`no banner external-manager <manager-name> [feature <feature-name> note <feature-note>]`

Parameter	Description
<code><manager-name></code>	A string that describes the management system.
<code><feature-name></code>	A string that describes the feature being managed.
<code><feature-note></code>	A note for the feature.

Default No external-manager banner entries are configured by default.

Mode Global Configuration

Usage notes When you run this command:

- if no entry exists for an external manager, the external manager, feature and note are added.
- if an entry already exists for an external manager, the feature and note are added to the existing manager.
- if the feature already exists for that manager, then the note is added to the existing feature.

The **no** variant of this command removes the specified note from the feature of the specified external manager.

- If there are no other notes for the feature, then the feature is removed.
- If the feature is removed and there are no other features for the external manager, then the external manager is removed.

Use the **no** variant with just the external manager name to remove an external manager and all its features and notes.

Example To add an external manager note for 'Vista Manager' for the feature 'traffic-control' with the note 'Dynamic Traffic Management', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# banner external-manager "Vista Manager" feature  
"traffic-control" note "Dynamic Traffic Management"
```

To remove the external manager note 'Dynamic Traffic Management' from the feature 'traffic-control' of the external manager 'Vista Manager', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no banner external-manager "Vista Manager"  
feature "traffic-control" note "Dynamic Traffic Management"
```

To remove all external manager features and notes for 'Vista Manager', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no banner external-manager "Vista Manager"
```

Related commands **banner display external-manager**
show banner external-manager

Command changes Version 5.5.1-1.1: command added

banner login (system)

Overview This command configures the login banner that is displayed on the console when you login. The login banner is displayed on all connected terminals. The login banner is displayed after the MOTD (Message-of-the-Day) banner and before the login username and password prompts.

Use the **no banner login** command to disable the login banner.

Syntax banner login
no banner login

Default By default, no login banner is displayed at console login.

Mode Global Configuration

Examples To configure a login banner of "Authorised users only" to be displayed when you login, enter the following commands:

```
awplus#configure terminal
awplus(config)#banner login
Type CNTL/D to finish.

Authorised users only

awplus(config)#exit
awplus#exit

Authorised users only

awplus login: manager
Password:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

awplus>
```

To remove the login banner, enter the following commands:

```
awplus#configure terminal
awplus(config)#no banner login
awplus(config)#exit
awplus#exit

awplus login: manager
Password:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

awplus>
```

Related commands [banner exec](#)
[banner motd](#)

banner motd

Overview Use this command to create or edit the text MotD (Message-of-the-Day) banner displayed before login. The MotD banner is displayed on all connected terminals. The MotD banner is useful for sending messages that affect all network users, for example, any imminent system shutdowns.

Use the **no** variant of this command to delete the MotD banner.

Syntax banner motd <motd-text>
no banner motd

Parameter	Description
<motd-text>	The text to appear in the Message of the Day banner.

Default By default, the device displays the AlliedWare Plus™ OS version and build date when you login.

Mode Global Configuration

Examples To configure a MotD banner of “System shutdown at 6pm today” to be displayed when you log in, enter the following commands:

```
awplus>enable
awplus#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
awplus(config)#banner motd System shutdown at 6pm today
awplus(config)#exit
awplus#exit

System shutdown at 6pm today
awplus login: manager
Password:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

awplus>
```

To delete the login banner, enter the following commands:

```
awplus>enable
awplus#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
awplus(config)#no banner motd
awplus(config)#exit
awplus#exit

awplus login: manager
Password:

AlliedWare Plus (TM) 5.5.5 04/05/26 12:00:00

awplus>
```


Related **banner exec**
commands **banner login (system)**

clock set

Overview This command sets the time and date for the system clock.

Syntax clock set <hh:mm:ss> <day> <month> <year>

Parameter	Description
<hh:mm:ss>	Local time in 24-hour format
<day>	Day of the current month, from 1 to 31
<month>	The first three letters of the current month
<year>	Current year, from 2000 to 2035

Mode Privileged Exec

Usage notes Configure the timezone before setting the local time. Otherwise, when you change the timezone, the device applies the new offset to the local time.

NOTE: If Network Time Protocol (NTP) is enabled, then you cannot change the time or date using this command. NTP maintains the clock automatically using an external time source. If you wish to manually alter the time or date, you must first disable NTP.

Example To set the time and date on your system to 2pm on the 2nd of October 2016, use the command:

```
awplus# clock set 14:00:00 2 oct 2016
```

Related commands [clock timezone](#)

clock summer-time date

Overview This command defines the start and end of summertime for a specific year only, and specifies summertime's offset value to Standard Time for that year.

The **no** variant of this command removes the device's summertime setting. This clears both specific summertime dates and recurring dates (set with the **clock summer-time recurring**).

By default, the device has no summertime definitions set.

Syntax `clock summer-time <timezone-name> date <start-day> <start-month> <start-year> <start-time> <end-day> <end-month> <end-year> <end-time> <1-180>`
`no clock summer-time`

Parameter	Description
<code><timezone-name></code>	A description of the summertime zone, up to 6 characters long.
<code>date</code>	Specifies that this is a date-based summertime setting for just the specified year.
<code><start-day></code>	Day that the summertime starts, from 1 to 31.
<code><start-month></code>	First three letters of the name of the month that the summertime starts.
<code><start-year></code>	Year that summertime starts, from 2000 to 2035.
<code><start-time></code>	Time of the day that summertime starts, in the 24-hour time format HH:MM.
<code><end-day></code>	Day that summertime ends, from 1 to 31.
<code><end-month></code>	First three letters of the name of the month that the summertime ends.
<code><end-year></code>	Year that summertime ends, from 2000 to 2035.
<code><end-time></code>	Time of the day that summertime ends, in the 24-hour time format HH:MM.
<code><1-180></code>	The offset in minutes.

Mode Global Configuration

Examples To set a summertime definition for New Zealand using NZST (UTC+12:00) as the standard time, and NZDT (UTC+13:00) as summertime, with the summertime set to begin on the 25th of September 2016 and end on the 2nd of April 2017:

```
awplus(config)# clock summer-time NZDT date 25 sep 2:00 2016 2  
apr 2:00 2017 60
```

To remove any summertime settings on the system, use the command:

```
awplus(config)# no clock summer-time
```

Related commands [clock summer-time recurring](#)
[clock timezone](#)

clock summer-time recurring

Overview This command defines the start and end of summertime for every year, and specifies summertime's offset value to Standard Time.

The **no** variant of this command removes the device's summertime setting. This clears both specific summertime dates (set with the **clock summer-time date**) and recurring dates.

By default, the device has no summertime definitions set.

Syntax clock summer-time <timezone-name> recurring <start-week> <start-day> <start-month> <start-time> <end-week> <end-day> <end-month> <end-time> <1-180>

no clock summer-time

Parameter	Description
<timezone-name>	A description of the summertime zone, up to 6 characters long.
recurring	Specifies that this summertime setting applies every year from now on.
<start-week>	Week of the month when summertime starts, in the range 1-5. The value 5 indicates the last week that has the specified day in it for the specified month. For example, to start summertime on the last Sunday of the month, enter 5 for <start-week> and sun for <start-day>.
<start-day>	Day of the week when summertime starts. Valid values are mon, tue, wed, thu, fri, sat or sun.
<start-month>	First three letters of the name of the month that summertime starts.
<start-time>	Time of the day that summertime starts, in the 24-hour time format HH:MM.
<end-week>	Week of the month when summertime ends, in the range 1-5. The value 5 indicates the last week that has the specified day in it for the specified month. For example, to end summertime on the last Sunday of the month, enter 5 for <end-week> and sun for <end-day>.
<end-day>	Day of the week when summertime ends. Valid values are mon, tue, wed, thu, fri, sat or sun.
<end-month>	First three letters of the name of the month that summertime ends.
<end-time>	Time of the day that summertime ends, in the 24-hour time format HH:MM.
<1-180>	The offset in minutes.

Mode Global Configuration

Examples To set a summertime definition for New Zealand using NZST (UTC+12:00) as the standard time, and NZDT (UTC+13:00) as summertime, with summertime set to start on the last Sunday in September, and end on the 1st Sunday in April, use the command:

```
awplus(config)# clock summer-time NZDT recurring 5 sun sep 2:00  
1 sun apr 2:00 60
```

To remove any summertime settings on the system, use the command:

```
awplus(config)# no clock summer-time
```

Related commands [clock summer-time date](#)
[clock timezone](#)

clock timezone

Overview This command defines the device's clock timezone. The timezone is set as a offset to the UTC.

The **no** variant of this command resets the system time to UTC.

By default, the system time is set to UTC.

Syntax `clock timezone <timezone-name> {minus|plus} [<0-13>|<0-12>:<00-59>]`
`no clock timezone`

Parameter	Description
<timezone-name>	A description of the timezone, up to 6 characters long.
minusorplus	The direction of offset from UTC. The minus option indicates that the timezone is behind UTC. The plus option indicates that the timezone is ahead of UTC.
<0-13>	The offset in hours or from UTC.
<0-12>:<00-59>	The offset in hours or from UTC.

Mode Global Configuration

Usage notes Configure the timezone before setting the local time. Otherwise, when you change the timezone, the device applies the new offset to the local time.

Examples To set the timezone to New Zealand Standard Time with an offset from UTC of +12 hours, use the command:

```
awplus(config)# clock timezone NZST plus 12
```

To set the timezone to Indian Standard Time with an offset from UTC of +5:30 hours, use the command:

```
awplus(config)# clock timezone IST plus 5:30
```

To set the timezone back to UTC with no offsets, use the command:

```
awplus(config)# no clock timezone
```

Related commands [clock set](#)
[clock summer-time date](#)
[clock summer-time recurring](#)

continuous-reboot-prevention

Overview Use this command to enable and to configure the continuous reboot prevention feature. Continuous reboot prevention allows the user to configure the time period during which reboot events are counted, the maximum number of times the switch can reboot within the specified time period, referred to as the threshold, and the action to take if the threshold is exceeded.

Use the **no** variant of this command to disable the continuous reboot prevention feature or to return the **period**, **threshold** and **action** parameters to the defaults.

Syntax continuous-reboot-prevention enable
continuous-reboot-prevention [period <0-604800>] [threshold <1-10>] [action [linkdown|logonly|stopreboot]]
no continuous-reboot-prevention enable
no continuous-reboot-prevention [period] [threshold] [action]]

Parameter	Description
enable	Enable the continuous reboot prevention feature.
period	Set the period of time in which reboot events are counted. <0-604800> Period value in seconds. The default is 600.
threshold	Set the maximum number of reboot events allowed in the specified period. <1-10> Threshold value. The default is 1.
action	Set the action taken if the threshold is exceeded. linkdown Reboot procedure continues and all switch ports and stack ports stay link-down. The reboot event is logged. This is the default action. logonly Reboot procedure continues normally and the reboot event is logged. stopreboot Reboot procedure stops until the user enters the key "c" via the CLI. Normal reboot procedure then continues and the reboot event is logged.

Default Continuous reboot prevention is disabled by default. The default period value is 600, the default threshold value is 1 and the default action is linkdown.

Mode Global Configuration

Usage notes Note that user-initiated reboots via the CLI, and software version auto-synchronization reboots, are not counted toward the threshold value.

Examples To enable continuous reboot prevention, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# continuous-reboot-prevention enable
```

To set the period to 500 and action to stopreboot, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# continuous-reboot-prevention period 500 action  
stopreboot
```

To return the period and action to the defaults and keep the continuous reboot prevention feature enabled, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no continuous-reboot-prevention period action
```

To disable continuous reboot prevention, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no continuous-reboot-prevention enable
```

Related commands [**show continuous-reboot-prevention**](#)
[**show reboot history**](#)
[**show tech-support**](#)

crypto secure-mode

- Overview** Use this command to put the device into Secure Mode. When in Secure Mode, the following are disabled:
- Telnet
 - SSHv1
 - SNMPv1/v2
 - All privilege levels except 1 and 15
 - Algorithms that are not supported under FIPS, including MD5, RSA-1 and DSA
 - The ability to store passwords in cleartext and to specify an **enable** password.

In Secure Mode, the web server on the device (used by the Device GUI) only accepts AES128-SHA ciphers.

NOTE: *Note: Stacking is not supported in Secure Mode.*

Use the **no** variant of this command to leave Secure Mode. You should delete all sensitive information first; see the ["Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide](#).

Syntax crypto secure-mode
no crypto secure-mode

Default By default, the device is not in Secure Mode.

Mode Global Configuration

Example For step-by-step instructions about how to enter and leave Secure Mode, see "How to Enable Secure Mode" in the ["Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide](#).

Related commands [boot system](#)
[crypto key zeroize](#)
[crypto pki trustpoint](#)
[crypto verify](#)
[show secure-mode](#)

Command changes Version 5.4.6-1.1: command added to x930 Series
Version 5.4.8-1.2: command added to x220, XS900MX, x550 Series
Version 5.4.8-2.1: command added to SBx908 GEN2, x950 Series

debug core-file

Overview Use this command to enable the generation of crash core files.

Use the **no** variant of this command to disable the generation of crash core files.

Syntax debug core-file
no debug core-file

Default Enabled.

Mode Global Configuration

Usage notes Core files may contain raw memory content. This may not be acceptable in a security certified network. Use the **no debug core-file** command to prevent such core files from being generated.

Example To prevent the generation of core files, use the commands:

```
awplus# configure terminal
awplus(config)# no debug core-file
```

Related commands [show system](#)

Command changes Version 5.4.9-1.0: command added

ecofriendly led

Overview Use this command to enable the eco-friendly LED (Light Emitting Diode) feature, which turns off power to the port LEDs.

Use the **no** variant of this command to disable the eco-friendly LED feature.

Syntax ecofriendly led
no ecofriendly led

Default The eco-friendly LED feature is disabled by default.

Mode Global Configuration

Usage notes While the eco-friendly LED feature is enabled, a port's LED will not change if the port's status changes. Instead, the LED will stay turned off. When you disable the eco-friendly feature again, that will restore power to the port LEDs. The LEDs will correctly show the current state of the ports, even if that state changed while the LEDs were off.

For an example of how to configure a trigger to turn off power to port LEDs, see the [Triggers Feature Overview and Configuration Guide](#).

Examples To enable the eco-friendly LED feature which turns off power to all port LEDs, use the following commands:

```
awplus# configure terminal
awplus(config)# ecofriendly led
```

To disable the eco-friendly LED feature, use the following commands:

```
awplus# configure terminal
awplus(config)# no ecofriendly led
```

Related commands [ecofriendly lpi](#)
[show ecofriendly](#)

ecofriendly lpi

Overview Use this command to conserve power by enabling the eco-friendly LPI (Low Power Idle) feature. This feature reduces the power supplied to the ports by the switch whenever the ports are idle and are connected to IEEE 802.3az Energy Efficient Ethernet compliant host devices.

LPI is a feature of the IEEE 802.3az Energy Efficient Ethernet (EEE) standard. LPI lowers power consumption of switch ports during periods of low link utilization when connected to IEEE 802.3az compliant host devices. If no data is sent then the switch port can enter a sleep state, called Low Power Idle (LPI), to conserve power used by the switch.

Use the **no** variant of this command to disable the eco-friendly LPI feature.

Syntax `ecofriendly lpi`
`no ecofriendly lpi`

Default The eco-friendly LPI feature is disabled by default.

Mode Interface Configuration for a switch port, or Interface Configuration for a range of switch ports.

Usage notes For an example of how to configure a trigger to enable the eco-friendly LPI feature, see the [Triggers Feature Overview and Configuration Guide](#).

All ports configured for LPI must support LPI in hardware and must be configured to auto negotiate by default or by using the **speed** and **duplex** commands as needed.

Examples To enable the eco-friendly LPI feature on a switch port, port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# ecofriendly lpi
```

To enable the eco-friendly LPI feature on a range of switch ports, port1.0.2- port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2-port1.0.4
awplus(config-if)# ecofriendly lpi
```

To disable the eco-friendly feature on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no ecofriendly lpi
```

Related commands

- duplex**
- ecofriendly led**
- show ecofriendly**
- show interface**
- speed**

findme

Overview Use this command to physically locate a specific device from a group of similar devices. Activating the command causes a selected number of port LEDs to alternately flash green then amber (if that device has amber LEDs) at a rate of 1 Hz.

Use the **no** variant of this command to deactivate the Find Me feature prior to the timeout expiring.

Syntax `findme [interface <port-list>] [timeout <duration>]`
`no findme`

Parameter	Description
<code>interface <port-list></code>	The ports to flash. The port list can be: • a switch port, e.g. port1.0.4 • a continuous range of ports separated by a hyphen, e.g. port1.0.1-port1.0.4 • a comma-separated list of ports and port ranges, e.g. port1.0.1,port1.0.3-port1.0.8.
<code>timeout <duration></code>	How long the LEDs flash, in seconds, in the range 5 to 3600 seconds. If you specify this, normal LED behavior is restored automatically after the specified time has elapsed, or a no findme command is used.

Default By default all port LEDs flash for 60 seconds.

Mode Privileged Exec

Example To activate the Find Me feature for the default duration (60 seconds), use the following command:

```
awplus# findme
```

To activate the Find Me feature for 120 seconds, use the following command:

```
awplus# findme timeout 120
```

To activate the Find Me feature for the default duration (60 seconds) on switch port interfaces port1.0.2 through port1.0.4, use the following command:

```
awplus# findme interface port1.0.2-port1.0.4
```

In the example above, ports 2 to 4 will flash 4 times and then all ports will flash twice. Each alternate flash will be amber (if that device has amber LEDs). This pattern will repeat until **timeout** (default or set) or **no findme** commands are used.

To deactivate the Find Me feature, use the following command:

```
awplus# no findme
```

findme trigger

Overview When this command is enabled, the LED flashing functionality of the **find-me** command is applied whenever any or all of the selected parameter conditions is detected.

Use the **no** variant to remove the findme trigger function for the selected parameter.

Syntax findme trigger {all|loopprot|thrash-limit|qsp}
no findme trigger {all|loopprot|thrash-limit|qsp}

Parameter	Description
all	Enable the find-me function whenever any of the listed parameter conditions are detected
loopprot	Enable the findme function whenever a loop protection condition is detected.
thrash-limit	Enable the findme function whenever a MAC address thrash-limiting condition is detected.
qsp	Enable the findme function whenever a QoS Storm Protection condition is detected.

Default The findme trigger function is disabled.

Mode Global config

Usage notes Note that findme trigger is not available if you have set the switch to take the following actions in response to an event:

- For loop detection, the actions **log-only** and **none**
- For MAC address thrash-limiting, the actions **learn-disable** and **none**.

Example To enable action LED flashing for the loop protection function:

```
awplus# findme trigger loopprot
```

Related commands [findme](#)
[loop-protection loop-detect](#)
[storm-protection](#)

hostname

Overview This command sets the name applied to the device as shown at the prompt. The hostname is:

- displayed in the output of the **show system** command
- displayed in the CLI prompt so you know which device you are configuring

Use the **no** variant of this command to revert the hostname setting to its default. For devices that are not part of an AMF network, the default is "awplus".

Syntax `hostname <hostname>`
`no hostname [<hostname>]`

Parameter	Description
<code><hostname></code>	Specifies the name given to a specific device. This is also referred to as the Node name in AMF output screens.

Default awplus

Mode Global Configuration

Usage notes Within an AMF network, any device without a user-defined hostname will automatically be assigned a name based on its MAC address.

To efficiently manage your network using AMF, we strongly advise that you devise a naming convention for your network devices and apply an appropriate hostname to each device.

The name must also follow the rules for ARPANET host names. The name must start with a letter, end with a letter or digit, and use only letters, digits, and hyphens. Refer to RFC 1035.

This command does not set the sysName MIB value. The hostname and the sysName MIB value are independent of each other. Use the **snmp-server system-name** command to set the MIB value.

Example To set the system name to HQ-Sales, use the commands:

```
awplus# configure terminal
awplus(config)# hostname HQ-Sales
```

This changes the prompt to:

```
HQ-Sales(config)#
```

To revert to the default hostname awplus, use the command:

```
HQ-Sales(config)# no hostname
```

This changes the prompt to:

```
awplus(config)#
```

NOTE:

*When AMF is configured, running the **no hostname** command will apply a hostname that is based on the MAC address of the device node, for example, **node_0000_5e00_5301**.*

Related commands [show system](#)
[snmp-server system-name](#)

Command changes Version 5.5.5-2.1: command no longer sets the sysName MIB value.

low-memory restart

Overview Use this command to specify a process for the device to terminate if available memory is sufficiently low.

This command is intended for use in consultation with Allied Telesis customer support. Using this command will make the device produce a core dump when the process terminates, which makes it easier for Allied Telesis engineers to debug any issues.

Use the **no** variant of this command to stop specifying the process for termination.

Syntax `low-memory restart <process-name>`
`no low-memory restart <process-name>`

Parameter	Description
<code><process-name></code>	The name of a process to terminate if the device memory gets sufficiently low.

Default None. By default, the device will automatically terminate the non-critical process that has the highest memory consumption. Note that only a non-critical process will be terminated automatically, not a critical process.

Mode Global Configuration

Usage notes The process does not have to be running when you enter this command. If it is running at the time the available memory becomes sufficiently low, the device will terminate it.

Example To specify RIP as the process to terminate if memory gets too low, use the commands:

```
awplus# configure terminal
awplus(config)# low-memory restart ripd
```

Related commands [show memory](#)
[snmp-server enable trap](#)

Command changes Version 5.5.4-2.3: command added

max-fib-routes

Overview This command enables you to control the maximum number of FIB routes configured. It operates by providing parameters that enable you to configure preset maximums and warning message thresholds.

NOTE: For static routes use the command.

Use the **no** variant of this command to set the maximum number of FIB routes to the default of 4294967294 FIB routes.

Syntax max-fib-routes <1-4294967294> [<1-100>|warning-only]
no max-fib-routes

Parameter	Description
max-fib-routes	This is the maximum number of routes that can be stored in the device's Forwarding Information dataBase. In practice, other practical system limits would prevent this maximum being reached.
<1-4294967294>	The allowable configurable range for setting the maximum number of FIB-routes.
<1-100>	This parameter enables you to optionally apply a percentage value. This percentage will be based on the maximum number of FIB routes you have specified. This will cause a warning message to appear when your routes reach your specified percentage value. Routes can continue to be added until your configured maximum value is reached.
warning-only	This parameter enables you to optionally apply a warning message. If you set this option a warning message will appear if your maximum configured value is reached. Routes can continue to be added until your device reaches either the maximum capacity value of 4294967294, or a practical system limit.

Default The default number of FIB routes is the maximum number of FIB routes (4294967294).

Mode Global Configuration

Examples To set the maximum number of dynamic routes to 2000 and warning threshold of 75%, use the following commands:

```
awplus# config terminal
awplus(config)# max-fib-routes 2000 75
```

max-static-routes

Overview Use this command to set the maximum number of static routes, excluding FIB (Forwarding Information Base) routes.

NOTE: For FIB routes use the command.

Use the **no** variant of this command to set the maximum number of static routes to the default of 1000 static routes.

Syntax max-static-routes <1-1000>
no max-static-routes

Default The default number of static routes is the maximum number of static routes (1000).

Mode Global Configuration

Example To reset the maximum number of static routes to the default maximum, use the command:

```
awplus# configure terminal
awplus(config)# no max-static-routes
```

NOTE: Static routes are applied before adding routes to the RIB (Routing Information Base). Therefore, rejected static routes will not appear in the running config.

Related commands [max-fib-routes](#)

no debug all

Overview This command disables the debugging facility for all features on your device. This stops the device from generating any diagnostic debugging messages.

You can optionally disable the debugging facility for only the given protocol or feature. The features available depend on your device and will be a subset of the features listed in the Syntax section below.

Syntax `no debug all [bgp|ipv6 ospf|ipv6 rip|dot1x|nsm|ospf|pim dense-mode|pim sparse-mode|rip|vrrp]`

Parameter	Description
bgp	Turns off all debugging for BGP (Border Gateway Protocol).
dot1x	Turns off all debugging for IEEE 802.1X port-based network access- control.
ipv6 ospf	Turns off all debugging for IPv6 OSPF (Open Shortest Path First).
ipv6 rip	Turns off all debugging for IPv6 RIP (Routing Information Protocol).
nsm	Turns off all debugging for the NSM (Network Services Module).
ospf	Turns off all debugging for OSPF (Open Shortest Path First).
pim dense-mode	Turns off all debugging for PIM (Protocol Independent Multicast) Dense Mode.
pim sparse-mode	Turns off all debugging for PIM (Protocol Independent Multicast) Sparse Mode.
rip	Turns off all debugging for RIP (Routing Information Protocol).
vrrp	Turns off all debugging for VRRP (Virtual Router Redundancy Protocol).

Default Disabled

Mode Global Configuration and Privileged Exec

Example To disable debugging for all features, use the command:

```
awplus# no debug all
```

To disable all 802.1X debugging, use the command:

```
awplus# no debug all dot1x
```

To disable all NSM debugging, use the command:

```
awplus# no debug all nsm
```

To disable all OSPF debugging, use the command:

```
awplus# no debug all ospf
```

To disable all PIM Dense Mode debugging, use the command:

```
awplus# no debug all pim dense-mode
```

To disable all PIM Sparse Mode debugging, use the command:

```
awplus# no debug all pim sparse-mode
```

To disable all RIP debugging, use the command:

```
awplus# no debug all rip
```

To disable all VRRP debugging, use the command:

```
awplus# no debug all vrrp
```

Related commands **undebug all**

Command changes Version 5.4.7-1.1: **pim dense-mode**, **pim sparse-mode**, and **rip** parameters added

reboot

Overview This command halts the device and performs a cold restart (also known as reload). It displays a confirmation request before restarting.

Syntax reboot
reload

Mode Privileged Exec

Usage notes The **reboot** and **reload** commands perform the same action.

Examples To restart the device, use the command:

```
awplus# reboot
reboot system? (y/n): y
```

reload

Overview This command performs the same function as the **reboot**.

show banner external-manager

Overview Use this command to show the current external-manager banner. The external-manager banner warns you that certain features are being managed by an external management system. For example, if you are using Vista Manager EX to manage your network, you will see a notification banner telling you which features are being managed after you enter Global Configuration Mode.

Syntax show banner external-manager

Mode User Exec

Example To show the external-manager banner, use the command:

```
awplus# show banner external-manager
```

Output The following shows typical output.

Example output from show banner external-manager

```
awplus#show banner external-manager
The following features are being managed by external systems.
Configuring these features may have unintended consequences.
Manager: Network Manager
  Feature: ACLs
  Filters

Manager: Vista Manager
  Feature: Traffic control
  Application Priority
  Dynamic Traffic Management
  Feature: Web control
  all features
```

Related commands [banner display external-manager](#)
[banner external-manager](#)

Command changes Version 5.5.1-1.1: command added

show clock

Overview This command displays the system's current configured local time and date. It also displays other clock related information such as timezone and summertime configuration.

Syntax show clock

Mode User Exec and Privileged Exec

Example To display the system's current local time, use the command:

```
awplus# show clock
```

Output The following shows typical output.

Example output from the show c lock command for a device using New Zealand time

```
Local Time: Mon, 17 Oct 2016 13:56:06 +1200
UTC Time: Mon, 17 Oct 2016 01:56:06 +0000
Timezone: NZST
Timezone Offset: +12:00
Summer time zone: NZDT
Summer time starts: Last Sunday in September at 02:00:00
Summer time ends: First Sunday in April at 02:00:00
Summer time offset: 60 mins
Summer time recurring: Yes
```

Parameters in the output of the show c lock command

Parameter	Description
Local Time	Current local time.
UTC Time	Current UTC time.
Timezone	The current configured timezone name.
Timezone Offset	Number of hours offset to UTC.
Summer time zone	The current configured summertime zone name.
Summer time starts	Date and time set as the start of summer time.
Summer time ends	Date and time set as the end of summer time.
Summer time offset	Number of minutes that summer time is offset from the system's timezone.
Summer time recurring	Whether the device will apply the summer time settings every year or only once.

Related commands

- clock set**
- clock summer-time date**
- clock summer-time recurring**
- clock timezone**

show continuous-reboot-prevention

Overview This command displays the current continuous reboot prevention configuration.

Syntax show continuous-reboot-prevention

Mode User Exec and Privileged Exec

Examples To show the current continuous reboot prevention configuration, use the command:

```
awplus# show continuous-reboot-prevention
```

Output The following shows typical output.

Example output from the show continuous-reboot-prevention command

```
-----  
Continuous reboot prevention  
-----  
status=disabled  
period=600  
threshold=1  
action=linkdown  
-----
```

Related commands [continuous-reboot-prevention](#)
[show reboot history](#)

show cpu

Overview Test paragraph

This command displays a list of running processes with their CPU utilization.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide.](#)**

Syntax show cpu [sort {thrds|pri|sleep|runtime}]

Parameter	Description
sort	Changes the sorting order using the following fields. If you do not specify a field, then the list is sorted by percentage CPU utilization.
thrds	Sort by the number of threads.
pri	Sort by the process priority.
sleep	Sort by the average time sleeping.
runtime	Sort by the runtime of the process.

Mode User Exec and Privileged Exec

Examples To show the CPU utilization of current processes, sorting them by the number of threads the processes are using, use the command:

```
awplus# show cpu sort thrds
```


Output The following shows typical output.

Example output from show cpu

```
CPU averages:
 1 second: 12%, 20 seconds: 2%, 60 seconds: 2%
System load averages:
 1 minute: 0.03, 5 minutes: 0.02, 15 minutes: 0.00
Current CPU load:
 userspace: 6%, kernel: 4%, interrupts: 1% iowaits: 0%

user processes
=====
  pid name          thrds  cpu%   pri state sleep% runtime
1544 hostd           1    2.8    20  run    0     120
1166 exfx            17    1.8    20  sleep  0    3846
1284 aisexec         44    0.9    -2  sleep  0   2606
   1 init             1    0.0    20  sleep  0     120
9772 sh              1    0.0    20  sleep  0        0
9773 corerotate       1    0.0    20  sleep  0        0
 853 syslog-ng        1    0.0    20  sleep  0     356
 859 klogd             1    0.0    20  sleep  0        1
 910 inetd             1    0.0    20  sleep  0        3
 920 portmap           1    0.0    20  sleep  0        0
 931 crond             1    0.0    20  sleep  0        1
1090 openhpid         11    0.0    20  sleep  0     233
1111 hpilogd            1    0.0    20  sleep  0        0
1240 hsl               1    0.0    20  sleep  0       79
1453 authd            1    0.0    20  sleep  0       85
...
```

Parameters in the output of the show cpu command

Parameter	Description
CPU averages	Average CPU utilization for the periods stated.
System load averages	The average number of processes waiting for CPU time for the periods stated.
Current CPU load	Current CPU utilization specified by load types.
pid	Identifier number of the process.
name	A shortened name for the process
thrds	Number of threads in the process.
cpu%	Percentage of CPU utilization that this process is consuming.
pri	Process priority state.
state	Process state; one of "run", "sleep", "zombie", and "dead".
sleep%	Percentage of time that the process is in the sleep state.

Parameter	Description
runtime	The time that the process has been running for, measured in jiffies. A jiffy is the duration of one tick of the system timer interrupt.

Related commands

- [show memory](#)
- [show memory allocations](#)
- [show memory history](#)
- [show memory pools](#)
- [show process](#)

show cpu history

Overview This command prints a graph showing the historical CPU utilization.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show cpu history

Mode User Exec and Privileged Exec

Usage notes This command’s output displays three graphs of the percentage CPU utilization:

- per second for the last minute, then
- per minute for the last hour, then
- per 30 minutes for the last 30 hours.

Examples To display a graph showing the historical CPU utilization of the device, use the command:

```
awplus# show cpu history
```

Output The following shows typical output.

Example output from the show cpu history command

```
Per second CPU load history

100
 90
 80
 70
 60
 50
 40
 30
 20
 10
*****
|....|....|....|....|....|....|....|....|....|....|....|....
Oldest                                         Newest
      CPU load% per second (last 60 seconds)
      * = average CPU load%

Per minute CPU load history

100
 90
 80
 70
 60
 50
 40
 30
 20 ++ ++++++++ ++++++++ +++++ + ++++++ +++++ + ++++++ ++++++++
 10 *****
    |....|....|....|....|....|....|....|....|....|....|....|....
    Oldest                                         Newest
          CPU load% per minute (last 60 minutes)
          * = average CPU load%, + = maximum

Per (30) minute CPU load history

100
 90
 80
 70
 60
 50
 40
 30
 20
 10
          ***
    |....|....|....|....|....|....|....|....|....|....|....|....
    Oldest                                         Newest
          CPU load% per 30 minutes (last 60 values / 30 hours)
          * = average, - = minimum, + = maximum
```

Related commands [show memory](#)
[show memory allocations](#)
[show memory pools](#)
[show process](#)

show debugging

Overview This command displays all debugging options in alphabetical order, indicating whether debugging is enabled or disabled for each feature.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging

Mode User Exec and Privileged Exec

Example To find out what debugging is enabled, use the command:

```
awplus# show debugging
```

Output The following shows typical output.

Example output from the show debugging command

```
awplus#show debugging
AAA debugging status:
  Authentication debugging is off
  Accounting debugging is off

% DHCP Snooping service is disabled

802.1X debugging status:

EPSR debugging status:
  EPSR Info debugging is off
  EPSR Message debugging is off
  EPSR Packet debugging is off
  EPSR State debugging is off

IGMP Debugging status:
  IGMP Decoder debugging is off
  IGMP Encoder debugging is off
...
```

show ecofriendly

Overview This command displays the switch's eco-friendly configuration status, including the **ecofriendly led** and **ecofriendly lpi** configuration.

Syntax show ecofriendly

Mode Privileged Exec and Global Configuration

Example To display the switch's eco-friendly configuration status, use the following command:

```
awplus# show ecofriendly
```

Output The following shows typical output.

Example output from the show ecofriendly command:

```
awplus#show ecofriendly
Front panel port LEDs      normal

Energy efficient ethernet
Port      Name      Configured  Status
port1.0.1  Port 1      lpi        lpi
port1.0.2              lpi        lpi
port1.0.3              lpi        lpi
port1.0.4              off        off
port1.0.5              lpi        off
port1.0.6  Port 6      off        off
port1.0.7              off        -
port1.0.8              off        -
port1.0.9              off        -
port1.0.10             off        -
...
```

Parameters in the output of the show ecofriendly command:

Parameter	Description
Front panel port LEDs	Whether the front panel ports show the port status or are turned off: • normal means the eco-friendly LED feature is disabled and port LEDs show the current state of the ports. This is the default setting. • off means the eco-friendly LED feature is enabled and power to the port LEDs is disabled.
Port	Displays the port number as assigned by the switch.
Name	Displays the port name if a name is configured for a port number.
Configured	Whether the eco-friendly LPI feature is configured on the port: • LPI means LPI is configured • off means LPI is not configured
Status	Whether the eco-friendly LPI feature is active on the port: • LPI means LPI is active • off means LPI is not active • a dash (-) if the port is not running

Related commands [ecofriendly led](#)
[ecofriendly lpi](#)

show interface memory

Overview This command displays the shared memory used by either all interfaces, or the specified interface or interfaces. The output is useful for diagnostic purposes by Allied Telesis authorized service personnel.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show interface memory
show interface *<port-list>* memory

Parameter	Description
<i><port-list></i>	Display information about only the specified port or ports. The port list can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.

Mode User Exec and Privileged Exec

Example To display the shared memory used by all interfaces, use the command:

```
awplus# show interface memory
```

To display the shared memory used by port1.0.1 and port1.0.3 to port1.0.4, use the command:

```
awplus# show interface port1.0.1,port1.0.3-port1.0.4 memory
```


Output The following shows typical output.

Example output from the show interface memory command

```
awplus#show interface memory
Vlan blocking state shared memory usage
-----
```

Interface	shmid	Bytes Used	nattch	Status
port1.0.1	491535	512	1	
port1.0.2	393228	512	1	
port1.0.3	557073	512	1	
...				
lo	425997	512	1	
po1	1179684	512	1	
po2	1212453	512	1	
sa3	1245222	512	1	

Example output from show interface <port-list> memory for a list of interfaces

```
awplus#show interface port1.0.1,port1.0.3-port1.0.4 memory
Vlan blocking state shared memory usage
-----
```

Interface	shmid	Bytes Used	nattch	Status
port1.0.1	589842	512	1	
port1.0.3	688149	512	1	
port1.0.4	327690	512	1	

Related commands

- [show interface brief](#)
- [show interface status](#)
- [show interface switchport](#)

show memory

Overview This command displays the memory used by each process that is currently running.

For information on filtering and saving command output, see the [Getting Started with the AlliedWare Plus Command Line Interface](#).

Syntax show memory [sort {size|peak|stk}]

Parameter	Description
sort	Changes the sorting order for the list of processes. If you do not specify this, then the list is sorted by percentage memory utilization.
size	Sort by the amount of memory the process is currently using.
peak	Sort by the greatest amount of memory ever used by the process.
stk	Sort by the stack size of the process.

Mode User Exec and Privileged Exec

Example To display the memory used by the current running processes, use the command:

```
awplus# show memory
```

Output The following shows typical output.

Example output from show memory

```
awplus#show memory sort stk

RAM total: 124384 kB; free: 64236 kB; buffers: 15888 kB

user processes
=====
  pid name          mem%  size(kB)  peak(kB)  data(kB)  stk(kB)  virt(kB)
490 openhpid        1.5    1988     7480     1308      528     6704
578 hsl             7.1    8940    29312     5148      312    21052
18986 imish         1.3    1660    13668     3876      172    13668
18931 imish         3.6    4548    13668     3876      172    13668
576 imi             4.6    5772    14532     4428      144    14532
572 nsm             4.9    6128    15092     4480      140    15092
574 hostd          1.6    2048     8116     1876      140     8116
586 cntrd           2.5    3168    12140     3288      140    12136
606 sflowd          2.8    3564    12336     3408      140    12336
610 authd           3.0    3808    12604     3472      140    12604
616 mstpd           3.1    3856    12652     3480      140    12652
...
```

Parameters in the output of the show memory command

Parameter	Description
Stack member	Stack member number.
RAM total	Total amount of RAM memory free.
free	Available memory size.
buffers	Memory allocated kernel buffers.
pid	Identifier number for the process.
name	Short name used to describe the process.
mem%	Percentage of memory utilization the process is currently using.
size	Amount of memory currently used by the process.
peak	Greatest amount of memory ever used by the process.
data	Amount of memory used for data.
stk	The stack size.

Related commands

- low-memory restart**
- show memory allocations**
- show memory history**
- show memory pools**
- show memory shared**
- snmp-server enable trap low-memory**

show memory allocations

Overview This command displays the memory allocations used by processes.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show memory allocations [<process>]

Parameter	Description
<process>	Displays the memory allocation used by the specified process.

Mode User Exec and Privileged Exec

Example To display the memory allocations used by all processes on your device, use the command:

```
awplus# show memory allocations
```

Output The following shows typical output.

Example output from the show memory allocations command

```
awplus#show memory allocations
Memory allocations for imi
-----
Current 15093760 (peak 15093760)

Statically allocated memory:
- binary/exe           :    1675264
- libraries            :    8916992
- bss/global data      :    2985984
- stack                :     139264

Dynamically allocated memory (heap):
- total allocated      :    1351680
- in use               :    1282440
- non-mmapped          :    1351680
- maximum total allocated :    1351680
- total free space     :      69240
- releasable           :     68968
- space in freed fastbins :        16

Context
+      filename:line   allocated   freed
.      lib.c:749       484
.
.
```

Related commands

- show memory**
- show memory history**
- show memory pools**
- show memory shared**
- show tech-support**

show memory history

Overview This command prints a graph showing the historical memory usage.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show memory history

Mode User Exec and Privileged Exec

Usage notes This command’s output displays three graphs of the percentage memory utilization:

- per second for the last minute, then
- per minute for the last hour, then
- per 30 minutes for the last 30 hours.

Examples To show a graph displaying the historical memory usage, use the command:

```
awplus# show memory history
```

Output The following shows typical output.

Example output from the show memory history command

```
Per minute memory utilization history
100
 90
 80
 70
 60
 50
 40*****
 30
 20
 10
    |...|...|...|...|...|...|...|...|...|...|...|...
    Oldest                                         Newest
      Memory utilization% per minute (last 60 minutes)
        * = average memory utilisation%.
...
```

Related commands

- [show memory allocations](#)
- [show memory pools](#)
- [show memory shared](#)
- [show tech-support](#)

show memory pools

Overview This command shows the memory pools used by processes.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show memory pools [*<process>*]

Parameter	Description
<i><process></i>	Displays the memory pools used by the specified process.

Mode User Exec and Privileged Exec

Example To shows the memory pools used by processes, use the command:

```
awplus# show memory pools
```

Output The following shows typical output.

Example output from the show memory pools command

```
awplus#show memory pools
Memory pools for imi
-----

Current 15290368 (peak 15290368)

Statically allocated memory:
- binary/exe           :    1675264
- libraries            :    8916992
- bss/global data      :   2985984
- stack                :    139264

Dynamically allocated memory (heap):
- total allocated      :   1548288
- in use               :   1479816
- non-mmapped         :   1548288
- maximum total allocated :   1548288
- total free space     :    68472
- releasable          :    68200
- space in freed fastbins :     16
.
.
.
```

Related commands [show memory allocations](#)
[show memory history](#)
[show tech-support](#)

show memory shared

Overview This command displays shared memory allocation information. The output is useful for diagnostic purposes by Allied Telesis authorized service personnel.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show memory shared

Mode User Exec and Privileged Exec

Example To display information about the shared memory allocation used on the device, use the command:

```
awplus# show memory shared
```

Output The following shows typical output.

Example output from the show memory shared command

```
awplus#show memory shared
Shared Memory Status
-----
Segment allocated   = 39
Pages allocated     = 39
Pages resident      = 11

Shared Memory Limits
-----
Maximum number of segments           = 4096
Maximum segment size (kbytes)        = 32768
Maximum total shared memory (pages) = 2097152
Minimum segment size (bytes)         = 1
```

Related commands [show memory allocations](#)
[show memory history](#)
[show memory](#)

show process

Overview This command lists a summary of the current running processes.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show process [sort {cpu|mem}]

Parameter	Description
sort	Changes the sorting order for the list of processes.
	cpu Sorts the list by the percentage of CPU utilization.
	mem Sorts the list by the percentage of memory utilization.

Mode User Exec and Privileged Exec

Usage notes This command displays a snapshot of currently-running processes. If you want to see CPU or memory utilization history instead, use the commands [show cpu history](#) or [show memory history](#).

Example To display a summary of the current running processes, use the command:
awplus# show process

Output The following shows typical output.

Example output from the show process command

```
CPU averages:
 1 second: 8%, 20 seconds: 5%, 60 seconds: 5%
System load averages:
 1 minute: 0.04, 5 minutes: 0.08, 15 minutes: 0.12
Current CPU load:
 userspace: 9%, kernel: 9%, interrupts: 0% iowaits: 0%
RAM total: 514920 kB; free: 382600 kB; buffers: 16368 kB

user processes
=====
pid name          thrds  cpu%  mem%  pri  state  sleep%
962 pss             12     0     6    25  sleep     5
1  init              1     0     0    25  sleep     0
797 syslog-ng       1     0     0    16  sleep    88
...
kernel threads
=====
pid name          cpu%  pri  state  sleep%
71  aio/0           0    20  sleep   0
3   events/0       0    10  sleep  98
...
```

Parameters in the output from the show process command

Parameter	Description
CPU averages	Average CPU utilization for the periods stated.
System load averages	The average number of processes waiting for CPU time for the periods stated.
Current CPU load	Current CPU utilization specified by load types
RAM total	Total memory size.
free	Available memory.
buffers	Memory allocated to kernel buffers.
pid	Identifier for the process.
name	Short name to describe the process.
thrds	Number of threads in the process.
cpu%	Percentage of CPU utilization that this process is consuming.
mem%	Percentage of memory utilization that this process is consuming.
pri	Process priority.

Parameter	Description
state	Process state; one of "run", "sleep", "stop", "zombie", or "dead".
sleep%	Percentage of time the process is in the sleep state.

Related commands [show cpu](#)
[show cpu history](#)

show reboot history

Overview Use this command to display the device's reboot history.

Syntax show reboot history

Mode User Exec and Privileged Exec

Example To show the reboot history, use the command:

```
awplus# show reboot history
```

Output The following shows typical output.

Example output from the show reboot history command

```
awplus#show reboot history
```

<date>	<time>	<type>	<description>
2016-10-10	01:42:04	Expected	User Request
2016-10-10	01:35:31	Expected	User Request
2016-10-10	01:16:25	Unexpected	Rebooting due to critical process (network/nsm) failure!
2016-10-10	01:11:04	Unexpected	Rebooting due to critical process (network/nsm) failure!
2016-10-09	19:56:16	Expected	User Request
2016-10-09	19:51:20	Expected	User Request

Parameters in the output from the show reboot history command

Parameter	Description
Unexpected	A non-intended reboot. The reboot is counted by the continuous reboot prevention feature, as long as the reboot occurred in the time period specified for continuous reboot prevention.
Expected	A planned or user-triggered reboot. The reboot is not counted by the continuous reboot prevention feature.
Continuous reboot prevention	A continuous reboot prevention event has occurred. The action taken is configured with the continuous-reboot-prevention command. The next time period during which reboot events are counted begins from this event.
User request	User initiated reboot via the CLI.

Related **show continuous-reboot-prevention**
commands **show tech-support**

show router-id

Overview Use this command to show the Router ID of the current system.

Syntax show router-id

Mode User Exec and Privileged Exec

Example To display the Router ID of the current system, use the command:

```
awplus# show router-id
```

Output The following shows typical output.

Example output from the show router-id command

```
awplus>show router-id  
Router ID: 10.55.0.2 (automatic)
```

show secure-mode

Overview Use this command to see whether secure mode is enabled or not. Secure mode disables a number of insecure features, such as Telnet.

Syntax show secure-mode

Mode User Exec/Privileged Exec

Example To see if secure mode is enabled, use the command:
awplus# show secure-mode

Output The following shows typical output.

Example output from show secure-mode

```
awplus#show secure-mode  
Secure mode is enabled
```

Related commands [crypto secure-mode](#)

show system

Overview Use this command to display general system information about the device, including the hardware, memory usage, and software version. It also displays location and contact details when these have been set.

For information on filtering and saving command output, see the [Getting Started with the AlliedWare Plus Command Line Interface](#).

Syntax show system

Mode User Exec and Privileged Exec

Example To display configuration information, use the command:

```
awplus# show system
```

Output The following shows typical output.

Example output from show system

System Status					Mon Sep 28 08:42:16 2020
Board	ID	Bay	Board Name	Rev	Serial number
Base	557	Base	AT-x320-10GH	X5-0	G2F6K300B

RAM: Total: 462104 kB Free: 304900 kB					
Flash: 95.8MB Used: 1.8MB Available: 94.0MB					

Environment Status : Normal					
Uptime : 0 days 00:02:05					
Bootloader version : 6.2.20					
Current software : x320-5.5.0-1.3.rel					
Software version : 5.5.0-1.3					
Build date : Wed Sep 9 21:10 UTC 2020					
Current boot config: flash:/default.cfg (file exists)					
System Name					
awplus					
System Contact					
System Location					

Related commands [show system environment](#)

show system environment

Overview Use this command to display the current environmental status of your device and its power supplies and any other expansion options. The environmental status covers information about temperatures, fans, and voltage.

For information on filtering and saving command output, see the [Getting Started with the AlliedWare Plus Command Line Interface](#).

Syntax show system environment

Mode User Exec and Privileged Exec

Example To display the system's environmental status, use the command:

```
awplus# show system environment
```

Output The following shows typical output.

Example output from show system environment

```
awplus#show system environment
Environment Monitoring Status

Overall Status: Normal

Resource ID: 1 Name: PSU Bay 1 ( )
ID Sensor (Units)          Reading Low Limit High Limit Status
1 Device Present           Yes      -      -      -      Ok
2 PSU Power Output         Yes      -      -      -      Ok

Resource ID: 2 Name: PSU Bay 2 ( )
ID Sensor (Units)          Reading Low Limit High Limit Status
1 Device Present           Yes      -      -      -      Ok
2 PSU Power Output         Yes      -      -      -      Ok

Resource ID: 3 Name: PSU Bay 3 ( )
ID Sensor (Units)          Reading Low Limit High Limit Status
1 Device Present           Yes      -      -      -      Ok
2 PSU Power Output         Yes      -      -      -      Ok

Resource ID: 4 Name: AT-x320-10GH
ID Sensor (Units)          Reading Low Limit High Limit Status
1 Voltage: 1.35V (Volts)    1.371   1.209   1.482   Ok
2 Voltage: 0.99V (Volts)    1.034   0.891   1.090   Ok
3 Voltage: 3.3V (Volts)     3.342   2.960   3.613   Ok
4 Voltage: 1.8V (Volts)     1.833   1.597   1.964   Ok
5 Voltage: 12.0V (Volts)    11.751  10.767  13.166  Ok
6 Temp: System (Degrees C)  24      -11     59      Ok
```

Related commands **show system**
show system environment counters
system psu unused
trigger
type env-sensor

show system environment counters

Overview Use this command to see the environmental sensor counters.

Syntax show system environment counters

Mode User Exec and Privileged Exec

Example To show the environment sensor counters, use the following command:

```
awplus# show system environment counters
```

Output The following shows typical output.

Example output from show system environment counters

```
awplus#show system environment counters
Environment Monitoring Counters

Resource ID: 1  Name: PSU Bay 1 ( )
ID Sensor      Value      Threshold  Checked   Read   Alarm   Alarm
                readings readings readings errors asserted cleared
1 Device Present      6          0          0         0         0         0
2 PSU Power Output    6          0          0         0         0         0

Resource ID: 2  Name: PSU Bay 2 ( )
ID Sensor      Value      Threshold  Checked   Read   Alarm   Alarm
                readings readings readings errors asserted cleared
1 Device Present      6          0          0         0         0         0
2 PSU Power Output    8          0          0         0         0         0

Resource ID: 3  Name: PSU Bay 3 ( )
ID Sensor      Value      Threshold  Checked   Read   Alarm   Alarm
                readings readings readings errors asserted cleared
1 Device Present      6          0          0         0         0         0
2 PSU Power Output    8          0          0         0         0         0

Resource ID: 4  Name: AT-x320-10GH
ID Sensor      Value      Threshold  Checked   Read   Alarm   Alarm
                readings readings readings errors asserted cleared
1 Voltage: 1.35V      7          12          0         0         0         0
2 Voltage: 0.99V      7          12          0         0         0         0
3 Voltage: 3.3V       7          12          0         0         0         0
4 Voltage: 1.8V       7          12          0         0         0         0
5 Voltage: 12.0V      7          12          0         0         0         0
6 Temp: System        7          12          0         0         0         0
```

Parameters in the output from show system environment counters

Parameter	Description
Value readings	Number of times that the value of this sensor has been read.
Threshold readings	Number of times that a threshold value related to this sensor has been read.
Checked readings	Number of times that this sensor has gone outside a threshold and has been re-read to confirm this is a genuine error.
Read errors	Number of times that there was an error returned when reading this sensor or one of its threshold values.
Alarm asserted	Number of times that this sensor has entered the fault state.
Alarm cleared	Number of times that this sensor has left the fault state.

Related **show system**
commands **show system environment**

Command Version 5.5.0-0.1: command added
changes

show system interrupts

Overview Use this command to display the number of interrupts for each IRQ (Interrupt Request) used to interrupt input lines on a PIC (Programmable Interrupt Controller) on your device.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show system interrupts

Mode User Exec and Privileged Exec

Example To display information about the number of interrupts for each IRQ in your device, use the command:

```
awplus# show system interrupts
```

Output The following shows typical output.

Example output from the show system interrupts command

```
awplus>show system interrupts
      CPU0
 1:      2   CPM2 SIU   Level Enabled   0   i2c-mpc
 2:     145   CPM2 SIU   Level Enabled   0   spi-mpc
77:      0   OpenPIC   Level Enabled   0   enet_tx
78:      2   OpenPIC   Level Enabled   0   enet_rx
82:      0   OpenPIC   Level Enabled   0   enet_error
90:    5849   OpenPIC   Level Enabled   0   serial
91:  2066672   OpenPIC   Level Enabled   0   i2c-mpc
94:     147   OpenPIC   Level Enabled   0   cpm2_cascade
112:      5   OpenPIC   Edge  Enabled   0   phy_interrupt
114:   398714   OpenPIC   Level Enabled   0   mvPP
115:   26247   OpenPIC   Level Enabled   0   mvPP
119:      0   OpenPIC   Edge  Enabled   0   Power supply status
...
BAD:      0
```

Related commands [show system environment](#)

show system mac

Overview This command displays the physical MAC address of the device.

Syntax show system mac

Mode User Exec and Privileged Exec

Example To display the physical MAC address enter the following command:

```
awplus# show system mac
```

Output The following shows typical output.

Example output from the show system mac command

```
awplus#show system mac  
eccd.6d9d.4eed (system)
```


show system pci device

Overview Use this command to display the PCI devices on your device.

Syntax show system pci device

Mode User Exec and Privileged Exec

Example To display information about the PCI devices on your device, use the command:

```
awplus# show system pci device
```

Output The following shows typical output.

Example output from the show system pci device command

```
awplus#show system pci device
00:0c.0 Class 0200: 11ab:00d1 (rev 01)
      Flags: bus master, 66Mhz, medium devsel, latency 128, IRQ 113
      Memory at 5ffff000 (32-bit, non-prefetchable) [size=4K]
      Memory at 58000000 (32-bit, non-prefetchable) [size=64M]

00:0d.0 Class 0200: 11ab:00d1 (rev 01)
      Flags: bus master, 66Mhz, medium devsel, latency 128, IRQ 116
      Memory at 57fff000 (32-bit, non-prefetchable) [size=4K]
      Memory at 50000000 (32-bit, non-prefetchable) [size=64M]
```

Related commands [show system environment](#)
[show system pci tree](#)

show system pci tree

Overview Use this command to display the PCI tree on your device.

Syntax show system pci tree

Mode User Exec and Privileged Exec

Example To display information about the PCI tree on your device, use the command:

```
awplus# show system pci tree
```

Output The following shows typical output.

Example output from the show system pci tree command

```
awplus>show system pci tree
-[00]--+-0c.0 11ab:00d1
      \-0d.0 11ab:00d1
```

Related commands [show system environment](#)
[show system pci device](#)

show system psu config

Overview Use this command to list the configurable power supplies in the system and whether they are configured as 'unused'. Unused power supplies are redundant power supplies that are intentionally not plugged in and have been marked as unused with the command **system psu unused**.

Syntax show system psu config

Mode Privileged Exec

Example To list the PSUs on the switch and whether or not they have been marked as unused, use the command:

```
awplus# show system psu config
```

Output The following shows typical output.

Example output from show system psu config

```
System PSU config information:
PSU ID  Unused
-----
1       No
2       Yes
```

Parameters in the output from show system psu config

Parameter	Description
PSU ID	The PSU ID number.
Unused	Yes or No to indicate whether or not the PSU has been marked as unused.

Related commands **show system**
show system environment
system psu unused

Command changes Version 5.5.4-2.3: command added

show system serialnumber

Overview This command shows the serial number information for the device.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show system serialnumber

Mode User Exec and Privileged Exec

Example To display the serial number information for the device, use the command:
awplus# show system serialnumber

Output The following shows typical output.

Example output from the show system serialnumber command

```
awplus#show system serialnumber
45AX5300X
```

show tech-support

Overview This command generates system and debugging information for the device and saves it to a file.

This command is useful for collecting a large amount of information so that it can then be analyzed for troubleshooting purposes. The output of this command can be provided to technical support staff when reporting a problem.

You can optionally limit the command output to display only information for a given protocol or feature. The features available depend on your device and will be a subset of the features listed in the table below.

Syntax show tech-support {[all|atmf|auth|bgp|card|dhcpsn|epsr|firewall|igmp|ip|ipv6|mld|openflow|ospf|ospf6|pim|rip|ripng|stack|stp|system|tacacs+|update]} [outfile <filename>]

Parameter	Description
all	Display full information
atmf	Display ATMF-specific information
auth	Display authentication-related information
bgp	Display BGP-related information
card	Display Chassis Card specific information
dhcpsn	Display DHCP Snooping specific information
epsr	Display EPSR specific information
firewall	Display firewall specific information
igmp	Display IGMP specific information
ip	Display IP specific information
ipv6	Display IPv6 specific information
mld	Display MLD specific information
openflow	Display information related to OpenFlow
ospf	Display OSPF related information
ospf6	Display OSPF6 specific information
pim	Display PIM related information
rip	RIP related information
ripng	Display RIPNG specific information
stack	Display stacking device information
stp	Display STP specific information
system	Display general system information
tacacs+	Display TACACS+ information
update	Display resource update specific information
|	Output modifier

Parameter	Description
>	Output redirection
>>	Output redirection (append)
outfile	Output file name
<filename>	Specifies a name for the output file. If no name is specified, this file will be saved as: tech-support.txt.gz.

Default Captures **all** information for the device.

By default the output is saved to the file 'tech-support.txt.gz' in the current directory. If this file already exists in the current directory then a new file is generated with the time stamp appended to the file name, for example 'tech-support20161009.txt.gz', so the previous file is retained.

Usage notes The command generates a large amount of output, which is saved to a file in compressed format. The output file name can be specified by outfile option. If the output file already exists, a new file name is generated with the current time stamp. If the output filename does not end with ".gz", then ".gz" is appended to the filename. Since output files may be too large for Flash on the device we recommend saving files to external memory or a TFTP server whenever possible to avoid device lockup. This method is not likely to be appropriate when running the working set option of AMF across a range of physically separated devices.

Mode Privileged Exec

Examples To produce the output needed by technical support staff, use the command:

```
awplus# show tech-support
```

speed (asyn)

Overview This command changes the console speed from the device. Note that a change in console speed is applied for subsequent console sessions. Exit the current session to enable the console speed change using the **clear line console** command.

Syntax speed <console-speed-in-bps>

Parameter	Description
<console-speed-in-bps>	Console speed Baud rate in bps (bits per second).
	1200 1200 Baud
	2400 2400 Baud
	9600 9600 Baud
	19200 19200 Baud
	38400 38400 Baud
	57600 57600 Baud
	115200 115200 Baud

Default The default console speed baud rate is 9600 bps.

Mode Line Configuration

Usage notes This command is used to change the console (asyn) port speed. Set the console speed to match the transmission rate of the device connected to the console (asyn) port on your device.

Example To set the terminal console (asyn0) port speed from the device to 57600 bps, then exit the session, use the commands:

```
awplus# configure terminal
awplus(config)# line console 0
awplus(config-line)# speed 57600
awplus(config-line)# exit
awplus(config)# exit
awplus# exit
```

Then log in again to enable the change:

```
awplus login:
Password:
awplus>
```

Related commands

- clear line console**
- line**
- show running-config**
- show startup-config**
- speed**

system psu unused

Overview Use this command to mark a switch's redundant PSU or power input as unused, if you have intentionally not plugged in that PSU. This may be helpful because otherwise the switch treats an unused PSU or power input as an environmental fault. The fault is displayed in output from commands such as **show system**, and in some configurations, the environmental fault may trigger an alarm. Marking a PSU or power input as unused prevents this.

Use the **no** variant of this command to stop marking the PSU as unused.

Syntax `system psu psu <psu-number> unused`
`no system psu psu <psu-number> unused`

Parameter	Description
<code>psu <psu-number></code>	The PSU number, from 1 to 4. PSU bays are often numbered on the physical chassis, or you can look at the output of show system environment and see which PSU is not powered.

Default No PSUs are marked as unused

Mode Global Configuration

- Usage notes**
- A warning will be logged and printed to the CLI if a PSU that is detected as powered is marked as unused.
 - The configuration is applied after the switch's code has started to run so an initial alarm may be raised, which will then be cleared.
 - On switches where the voltage input sensor for the relevant PSU is treated as unavailable, no high or low threshold alarms will be generated for the sensor while it is marked as unused.
 - The x320-10GH switch has three PSU inputs treated as fixed PSU slots. These will be marked as optional. When setting them to unused, the fixed PSU bay will be marked as 'power not required', to prevent alarms for the PSU power input regardless of state.
 - On switches where this feature marks a PSU bay as 'power not required', SNMP traps may still be sent when the power status of the PSU changes state. However, the traps will always be AT-ENVMONv2-MIB::atEnvMonv2PsbAlarmClearedNotify. If the bay was not marked as 'power not required', instead an AT-ENVMONv2-MIB::atEnvMonv2PsbAlarmSetNotify trap would be sent if power was removed.

Example To mark PSU 2 as unused, use the commands:

```
awplus# configure terminal
awplus(config)# system psu psu 2 unused
```

Related commands **show system**
show system environment
show system psu config

Command changes Version 5.5.4-2.3: command added

terminal monitor

Overview Use this command to display debugging output on a terminal.

To display the cursor after a line of debugging output, press the Enter key.

Use the command **terminal no monitor** or **no terminal monitor** to stop displaying debugging output on the terminal. Alternatively, you can use the timeout option to stop displaying debugging output on the terminal after a set time.

Syntax terminal monitor [<1-60>]
terminal no monitor
no terminal monitor

Parameter	Description
<1-60>	Set a timeout between 1 and 60 seconds for terminal output.

Default Disabled

Mode User Exec and Privileged Exec

Examples To display debugging output on a terminal, enter the command:

```
awplus# terminal monitor
```

To display debugging on the terminal for 60 seconds, enter the command:

```
awplus# terminal monitor 60
```

To stop displaying debugging output on the terminal, use the command:

```
awplus# no terminal monitor
```

Related commands All debug commands

Command changes Version 5.4.8-0.2: **no terminal monitor** added as an alias for **terminal no monitor**

undebug all

Overview This command applies the functionality of the **no debug all** command.

7

Pluggables and Cabling Commands

- Contents**
- **Introduction** on page 291
 - **clear fiber-monitoring interface** on page 292
 - **clear test cable-diagnostics tdr** on page 293
 - **debug fiber-monitoring** on page 294
 - **fiber-monitoring action** on page 296
 - **fiber-monitoring baseline** on page 298
 - **fiber-monitoring enable** on page 300
 - **fiber-monitoring interval** on page 301
 - **fiber-monitoring sensitivity** on page 302
 - **show system fiber-monitoring** on page 304
 - **show system pluggable** on page 307
 - **show system pluggable detail** on page 309
 - **show system pluggable diagnostics** on page 314
 - **show test cable-diagnostics tdr** on page 317
 - **test cable-diagnostics tdr interface** on page 318

Introduction

- Overview** This chapter provides an alphabetical reference of commands used to configure and monitor Pluggables and Cabling, including:
- Cable Fault Locator for finding faults in copper cabling
 - Optical Digital Diagnostic Monitoring (DDM) to help find fiber issues when links go down
 - Active Fiber Monitoring for detecting changes in optical power received over fiber cables.

For more information, see the **Pluggables and Cabling Feature Overview and Configuration Guide**.

clear fiber-monitoring interface

Overview Use this command to clear the Active Fiber Monitoring state of a port. It clears the alarm, baseline and history and starts monitoring from the beginning. It does not change the configuration.

Syntax clear fiber-monitoring interface *<port>*

Parameter	Description
<i><port></i>	The name of the port to reset Active Fiber Monitoring on.

Default n/a

Mode Privileged Exec

Usage notes Normally, you do not need to clear the Active Fiber Monitoring state of a port. If the issue resolves itself and the monitored optical power returns to the baseline, the alarm clears automatically.

However, you may need to clear the Active Fiber Monitoring state if the optical power level reduces for a known reason, causing the port to be stuck in the alarm state. In this situation, the alarm will not clear automatically, because Active Fiber Monitoring does not update the baseline when the port is in the alarm state, for security reasons.

Example To clear the Active Fiber Monitoring state for interface port1.0.25, use the command:

```
awplus# clear fiber-monitoring interface port1.0.25
```

Related commands [show system fiber-monitoring](#)

Command changes Version 5.4.8-0.2: command added

clear test cable-diagnostics tdr

Overview Use this command to clear the results of the last cable test that was run.

Syntax clear test cable-diagnostics tdr

Mode Privileged Exec

Examples To clear the results of a previous cable-diagnostics test use the following commands:

```
awplus# clear test cable-diagnostics tdr
```

Related commands [show test cable-diagnostics tdr](#)
[test cable-diagnostics tdr interface](#)

debug fiber-monitoring

Overview Use this command to enable debugging of active fiber monitoring on the specified ports.

Use the **no** variant of this command to disable debugging on all ports or the specified ports.

Syntax debug fiber-monitoring interface *<port-list>*
no debug fiber-monitoring [interface *<port-list>*]

Parameter	Description
<i><port-list></i>	The list of fiber ports to enable or disable debugging for, as a single port, a comma separated list or a hyphenated range.

Default Debugging of active fiber monitoring is disabled by default.

Mode User Exec/Privileged Exec

Usage While debugging is enabled by this command for a port, all the optical power readings for the port are sent to the console.

Example To enable debugging messages for active fiber monitoring of port1.0.25 to be sent to the console, use the commands:

```
awplus# debug fiber-monitoring interface port1.0.25  
awplus# terminal monitor
```

To disable debugging messages for active fiber monitoring on port1.0.25, use the command:

```
awplus# no debug fiber-monitoring interface port1.0.25
```

To disable all debugging messages for active fiber monitoring, use the command:

```
awplus# no debug fiber-monitoring
```

Output The following shows typical output.

Example output from debug fiber-monitoring

```
awplus#debug fiber-monitoring interface port1.0.25
awplus#terminal monitor
% Warning: Console logging enabled
awplus#01:42:50 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1
Reading:1748 Baseline:1708 Threshold:1356
01:42:52 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1 Reading:1717
Baseline:1709 Threshold:1357
01:42:54 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1 Reading:1780
Baseline:1709 Threshold:1357
01:42:56 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1 Reading:1685
Baseline:1710 Threshold:1358
01:42:58 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1 Reading:1701
Baseline:1710 Threshold:1358
01:43:01 awplus Pluggable[522]: Fiber-monitor port2.0.1: Channel:1 Reading:1733
Baseline:1709 Threshold:1357
```

Related [show system fiber-monitoring commands](#)

fiber-monitoring action

Overview Use this command to specify an action to be taken if the optical power received on the port changes from the baseline by the amount specified in the **fiber-monitoring sensitivity** command.

Use the **no** variant of this command to remove the specified action or all actions from the port.

Syntax fiber-monitoring action [trap] [shutdown] [continuous]
no fiber-monitoring action [trap|shutdown]

Parameter	Description
trap	Send an SNMP notification.
shutdown	Shutdown the port.
continuous	Make the action or actions happen continuously (every polling interval) while the sensor is in the alarm state. Otherwise, the action only happens when the alarm is triggered or cleared.

Default By default a log message is generated, but no additional action is performed.

Mode Interface Configuration mode for a fiber port.

Usage If fiber monitoring is enabled and this command is not used to set an action, a change in received power on a fiber port only generates a log message.

Example To set the device to send an SNMP trap when port1.0.25 or port1.0.26 receive reduced power and when that reduced-power alarm is cleared, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# fiber-monitoring action trap
```

To set the device to send an SNMP trap when port1.0.25 or port1.0.26 receive reduced power, and every polling interval after that until the alarm is cleared, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# fiber-monitoring action trap continuous
```

To set the device to send an SNMP trap and to shut down the port when port1.0.25 or port1.0.26 receive reduced power, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# fiber-monitoring action trap shutdown
```

To set the device to stop shutting down the port if port1.0.25 or port1.0.26 receive reduced power, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# no fiber-monitoring action shutdown
```

If the device is set to send an SNMP trap for those ports, it will continue to do so.

To set the device not to perform any action when it receives reduced power on port1.0.25 or port1.0.26, except sending a log message, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# no fiber-monitoring action
```

Related commands [fiber-monitoring sensitivity](#)
[show system fiber-monitoring](#)

Command changes Version 5.4.8-0.2: **continuous** parameter added

fiber-monitoring baseline

Overview Use this command to configure how the baseline value for comparison is calculated for active fiber monitoring on the port.

Note that alarm generation will not commence until the link has been up for a full averaging period.

Use the **no** variant of this command to set the fiber-monitoring baseline to its default value.

Syntax fiber-monitoring baseline average <12-150> [interval <2-86400>]
fiber-monitoring baseline fixed <1-65535>
no fiber-monitoring baseline

Parameter	Description
average <12-150>	Set the baseline optical power received to be based on the moving average of the specified number of most recent (non-zero) values. Default is to use this setting and 12 values.
interval <2-86400>	Optionally, specify the optical power polling interval for determining the baseline, in seconds. By default, the baseline polling interval is the same as the monitoring polling interval, which is 5 seconds by default. If specified, this baseline interval should be larger than the monitoring interval. Even if you specify a baseline interval, Active Fiber Monitoring will use the monitoring interval to calculate the initial baseline average. This means the first x baseline readings will be taken at the monitoring interval, where x is the number of readings specified in the average parameter. See Usage below for more information.
fixed <1-65535>	Set the baseline to a fixed level of received optical power in 0.0001mW. Not recommended—see Usage below.

Default The default is a moving average of the last 12 values, taken at the same interval as the monitoring interval. The monitoring interval is set using the **fiber-monitoring interval** command. If the monitoring interval is set to its default of 5 seconds, the **fiber-monitoring baseline** default will be the average over the last minute.

Mode Interface Configuration for a fiber port

Usage notes There are two ways to configure the baseline. The first is to choose a number of readings to average. This is the default and recommended method. The second is to set a fixed value in units of x0.0001mW.

If a fixed value is required, the easiest way to choose a value is to enable fiber monitoring on the port and use the **show system fiber-monitoring** command to see what readings you can expect.



CAUTION: *We do not recommend setting a fixed value because gradual change over time caused by temperature fluctuations, etc. could lead to unnecessary alarms.*

If you use the averaging method, you can optionally specify how often Active Fiber Monitoring polls the cable to determine the baseline. This allows Active Fiber Monitoring to update the baseline less often than it polls the device for monitoring.

In order to prevent the theoretical possibility of slow clamping, you can set the baseline interval to a large value, so that the baseline average is only updated with the current reading (for example) once per day or once per hour.

As fiber attenuation can be affected by ambient temperature, take care if changing the baseline interval in environments with large daily temperature fluctuations.

Example To set the baseline optical power to a moving average of the last 30 monitoring readings on port1.0.25 and port1.0.26, use the command:

```
awplus(config)# interface port1.0.25-port1.0.26
awplus(config-if)# fiber-monitoring baseline average 30
```

To calculate the baseline based on 12 values taken 24 hours (86400 seconds) apart, instead of using the monitoring interval, use the command:

```
awplus(config)# interface port1.0.25-port1.0.26
awplus(config-if)# fiber-monitoring baseline average 12 interval
86400
```

To set the baseline to its default, averaging the last 12 readings, use the command:

```
awplus(config)# interface port1.0.25-port1.0.26
awplus(config-if)# no fiber-monitoring baseline
```

Related commands [fiber-monitoring interval](#)
[fiber-monitoring sensitivity](#)

Command changes Version 5.4.8-0.2: **interval** parameter added

fiber-monitoring enable

Overview Use this command to enable active fiber monitoring on a fiber port. If the port can support fiber monitoring but does not have the correct SFP or fiber type installed, the configuration will be saved, and monitoring will commence when a supported SFP is inserted. Disabling and re-enabling fiber monitoring on a port resets the baseline calculation.

Use the **no** variants of this command to disable active fiber monitoring on the interface, or to remove all the configuration and state for the ports, respectively.

Syntax fiber-monitoring enable
no fiber-monitoring enable
no fiber-monitoring

Default Active fiber monitoring is disabled by default

Mode Interface Configuration mode for a fiber port

Examples To enable active fiber monitoring on port1.0.25 and port1.0.26, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# fiber-monitoring enable
```

To disable fiber monitoring on the ports, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# no fiber-monitoring enable
```

To remove all fiber-monitoring configuration and state for the ports, use the commands:

```
awplus(config)# interface port1.0.25-port1.0.26  
awplus(config-if)# no fiber-monitoring
```

Related commands [fiber-monitoring action](#)
[fiber-monitoring sensitivity](#)
[show system fiber-monitoring](#)

fiber-monitoring interval

Overview Use this command to configure the fiber monitoring polling interval in seconds for the port. The optical power will be read every <interval> seconds and compared against the calculated threshold values to see if a log message or other action is required.

Use the **no** variant of this command to reset the polling interval to the default (5 seconds).

Syntax fiber-monitoring interval <2-60>
no fiber-monitoring interval

Parameter	Description
<2-60>	Optical power polling interval in seconds.

Default The interval is set to 5 seconds by default.

Mode Interface configuration mode for a fiber port.

Example To set the fiber monitoring polling interval for port1.0.25 to 30 seconds, use the commands:

```
awplus(config)# interface port1.0.25
awplus(config-if)# fiber-monitoring interval 30
```

To reset the fiber monitoring polling interval back to the default (5s), use the commands:

```
awplus(config)# interface port1.0.25
awplus(config-if)# no fiber-monitoring interval
```

Related commands [fiber-monitoring baseline](#)
[show system fiber-monitoring](#)

fiber-monitoring sensitivity

Overview Use this command to configure the sensitivity of the alarm thresholds on the port for active fiber monitoring.

Use the **no** variant of this command to reset the sensitivity to the default.

Syntax fiber-monitoring sensitivity (low|medium|high|highest|fixed <25-65535>)|relative <0.01-10.0>
no fiber-monitoring sensitivity

Parameter	Description
low	Low sensitivity (+/-2 dB)
medium	Medium sensitivity (1 dB) (default)
high	High sensitivity (the greater of 0.5 dB and 0.0025 mW)
highest	The highest sensitivity available: 0.0025mW
fixed <25-65535>	Fixed sensitivity at the specified level in 0.0001 mW.
relative <0.01-10.0>	Relative sensitivity at the specified level in dB.

Default Medium sensitivity.

Mode User Exec/Privileged Exec

Usage A log message is generated and configured actions are taken if the received optical power drops below the baseline value by the sensitivity configured with this command.

The sensitivity can be configured to one of four pre-defined levels in decibels or to a fixed absolute delta in units of 0.0001mW. The alarm thresholds can be seen in the **show system fiber-monitoring** output. The maximum absolute sensitivity configurable is 0.0025 mW. Note that 0.0025 mW equates to a reduction of approximately 1dB at the maximum attenuation of an AT-SPLX10/1.

Example To set the fiber monitoring sensitivity for port1.0.25 to a relative sensitivity of 0.1 dB, use the commands:

```
awplus(config)# interface port1.0.25  
awplus(config-if)# fiber-monitoring sensitivity relative 0.1
```

To reset the fiber monitoring sensitivity to the default (medium), use the commands:

```
awplus(config)# interface port1.0.25  
awplus(config-if)# no fiber-monitoring sensitivity
```

Related commands

- fiber-monitoring action**
- fiber-monitoring baseline**
- show system fiber-monitoring**

show system fiber-monitoring

Overview Use this command to display settings and current status for Active Fiber Monitoring.

Syntax show system fiber-monitoring

Mode User Exec and Privileged Exec

Example To display configuration and status for active fiber monitoring on ports, use the command:

```
awplus# show system fiber-monitoring
```

Output The following shows typical output.

Example output from show system fiber-monitoring

```
awplus#show sys fiber-monitoring
Fiber Monitoring Status
  Reading units 0.0001mW

Interface port1.0.25
Status:          enabled
Supported:       Supported pluggable
Debugging:       disabled
Interval:        2 seconds
Sensitivity:     1.00dB
Baseline type:   average of last 35 values greater than 50
Status:
  Baseline value: 496
  Alarm threshold: 393
  Alarm:          no
  Last 12 Readings: 498 498 498 498 498 498 498 498 498 498 498 498
  Minimum reading: 486
  Maximum reading: 498

Interface port1.0.26
Status:          enabled
Supported:       Supported pluggable
Debugging:       disabled
Interval:        2 seconds
Sensitivity:     1.00dB
Baseline type:   average of last 30 values greater than 50
Status:
  Baseline value: 0
  Alarm threshold: 0
  Alarm:          no
  Last 12 Readings: 0 0 0 0 0 0 0 0 0 0 0 0
  Minimum reading: 0
  Maximum reading: 0
```

Parameters in the output from show system fiber-monitoring

Parameter	Description
Reading units	The units for optical power readings in the rest of the display, e.g. 0.0001mW.
Status	Whether active fiber monitoring is enabled or disabled for this port.
Supported	Whether the pluggable inserted in this port supports active fiber monitoring.
Debugging	Whether debugging of active fiber monitoring is enabled or disabled for this port.
Interval	The configured interval between readings of optical power on this port.
Sensitivity	The configured sensitivity threshold for optical power changes on this port.

Parameter	Description
Baseline type	How the baseline optical power level is calculated: either the average of the specified number of previous readings or a specified fixed value in 0.0001mW.
Status	Current values for the following parameters.
Baseline value	The baseline value, calculated according to the configured baseline method, in 0.0001mW.
Alarm threshold	The current threshold for a change in optical power, calculated according to the configured sensitivity method, that will result in action.
Alarm	Whether the optical power at the most recent reading fallen below the threshold.
Last 12 readings	The last 12 optical power values measured, in 0.0001mW, with oldest value first.
Minimum reading	The lowest optical power reading since the fiber pluggable was last inserted, or since active fiber monitoring was last enabled on the port.
Maximum reading	The highest optical power reading since the fiber pluggable was last inserted, or since active fiber monitoring was last enabled on the port.

Related commands

- [debug fiber-monitoring](#)
- [fiber-monitoring action](#)
- [fiber-monitoring baseline](#)
- [fiber-monitoring enable](#)
- [fiber-monitoring interval](#)
- [fiber-monitoring sensitivity](#)

show system pluggable

Overview This command displays **brief** pluggable transceiver information showing the pluggable type, the pluggable serial number, and the pluggable port on the device. Different types of pluggable transceivers are supported in different models of device. See your Allied Telesis dealer for more information about the models of pluggables that your device supports.

Syntax show system pluggable [<port-list>]

Parameter	Description
<port-list>	The ports to display information about. The port list can be: • a single port (e.g. port1.0.25) • a continuous range of ports separated by a hyphen (e.g. port1.0.25-port1.0.26) • a comma-separated list of ports and port ranges (e.g. port1.0.25,port1.0.26)

Mode User Exec and Privileged Exec

Example To display brief information about all installed pluggable transceivers, use the command:

```
awplus# show system pluggable
```

Output The following shows typical output.

Example output from show system pluggable

awplus#show system pluggable System Pluggable Information						
Port	Vendor	Device	Serial Number	Datecode	Type	
port1.0.25	ATI	AT-SPSX	A03240R151300867	15032801	1000BASE-SX	
port1.0.26	ATI	AT-SPSX	A03240R111800076	15032801	1000BASE-SX	

Parameters in the output from the show system pluggable command

Parameter	Description
Port	Specifies the port number for the installed pluggable transceiver.
Vendor	Specifies the vendor's name for the installed pluggable transceiver.

Parameter	Description
Device	Specifies the device name for the installed pluggable transceiver.
Serial Number	Specifies the serial number for the installed pluggable transceiver.
Datecode	Specifies the manufacturing datecode for the installed pluggable transceiver. Checking the manufacturing datecode with the vendor may be useful when determining Laser Diode aging issues. For more information, see "Troubleshooting Fiber and Pluggable Issues" in the "Pluggables and Cabling" Feature Overview and Configuration Guide .
Type	Specifies the device type for the installed pluggable transceiver.

Related commands [show system environment](#)
[show system pluggable detail](#)
[show system pluggable diagnostics](#)

show system pluggable detail

Overview This command displays detailed pluggable transceiver information showing the pluggable type, the pluggable serial number, and the pluggable port on the device. Different types of pluggable transceivers are supported in different models of device. See your Allied Telesis reseller or distributor for more information about the models of pluggables that your device supports.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show system pluggable [*<port-list>*] detail

Parameter	Description
<i><port-list></i>	The ports to display information about. The port list can be: • a single port (e.g. port1.0.25) • a continuous range of ports separated by a hyphen (e.g. port1.0.25-port1.0.26) • a comma-separated list of ports and port ranges (e.g. port1.0.25,port1.0.26)

Mode User Exec and Privileged Exec

Usage notes In addition to the information about pluggable transceivers displayed using the **show system pluggable** command (port, manufacturer, serial number, manufacturing datecode, and type information), the **show system pluggable detail** command displays the following information:

- **SFP Laser Wavelength:** Specifies the laser wavelength of the installed pluggable transceiver.
- **Single mode Fiber:** Specifies the link length supported by the pluggable transceiver using single mode fiber.
- **OM1 (62.5µm) Fiber:** Specifies the link length, in meters (m) or kilometers (km) supported by the pluggable transceiver using 62.5 micron multi-mode fiber.
- **OM2 (50µm) Fiber:** Specifies the link length (in meters or kilometers) supported by the pluggable transceiver using 50 micron multi-mode fiber.
- **Diagnostic Calibration:** Specifies whether the pluggable transceiver supports DDM or DOM Internal or External Calibration.
 - **Internal** is displayed if the pluggable transceiver supports DDM or DOM Internal Calibration.
 - **External** is displayed if the pluggable transceiver supports DDM or DOM External Calibration.
 - a dash (-) is displayed if neither Internal Calibration or External Calibration is supported.
- **Power Monitoring:** Displays the received power measurement type, which can be either **OMA** (Optical Module Amplitude) or **Avg** (Average Power) measured in µW.

NOTE: For parameters that are not supported or not specified, a hyphen is displayed instead.

Example To display detailed information about the pluggable transceivers installed in a particular port on the device, use a command like:

```
awplus# show system pluggable port1.0.25 detail
```

To display detailed information about all the pluggable transceivers installed on the device, use the command:

```
awplus# show system pluggable detail
```

Output The following shows typical output.

Example output from show system pluggable detail for a port

```
awplus#show system pluggable port1.0.25 detail
System Pluggable Information Detail
port1.0.25
=====
Vendor Name:                ATI
Device Name:                AT-SPSX
Device Revision:            A
Device Type:                1000BASE-SX
Serial Number:              A02420N0607J0023
Manufacturing Datecode:     060704
SFP Laser Wavelength:       850nm
LinkLength Supported
  Single Mode Fiber :       -
    OM1 (62.5um) Fiber:     150m
    OM2 (50um) Fiber :      300m
    OM3 (50um) Fiber :      -
Diagnostic Calibration:      External
Power Monitoring:            Average
```

Parameters in the output from show system pluggable detail

Parameter	Description
Port	Specifies the port the pluggable transceiver is installed in.
Vendor Name	Specifies the vendor's name for the installed pluggable transceiver.
Device Name	Specifies the device name for the installed pluggable transceiver.
Device Revision	Specifies the hardware revision code for the pluggable transceiver. This may be useful for troubleshooting because different devices may support different pluggable transceiver revisions.
Device Type	Specifies the device type for the installed pluggable transceiver.
Serial Number	Specifies the serial number for the installed pluggable transceiver.
Manufacturing Datecode	Specifies the manufacturing datecode for the installed pluggable transceiver. Checking the manufacturing datecode with the vendor may be useful when determining Laser Diode aging issues. For more information, see "Troubleshooting Fiber and Pluggable Issues" in the "Pluggables and Cabling" Feature Overview and Configuration Guide .
SFP Laser Wavelength	Specifies the laser wavelength of the installed pluggable transceiver.
Single Mode Fiber	Specifies the link length supported by the pluggable transceiver using single mode fiber.
OM1 (62.5um) Fiber	Specifies the link length (in μm - micron) supported by the pluggable transceiver using 62.5 micron multi-mode fiber.
OM2 (50um) Fiber	Specifies the link length (in μm - micron) supported by the pluggable transceiver using 50 micron multi-mode fiber.
Diagnostic Calibration	Specifies whether the pluggable transceiver supports DDM or DOM Internal or External Calibration: Internal is displayed if the pluggable transceiver supports DDM or DOM Internal Calibration. External is displayed if the pluggable transceiver supports DDM or DOM External Calibration.

Parameter	Description
	- is displayed if neither Internal Calibration or External Calibration is supported.
Power Monitoring	Displays the received power measurement type, which can be either OMA (Optical Module Amplitude) or Avg (Average Power) measured in μW .

Related commands

- [show system environment](#)
- [show system pluggable](#)
- [show system pluggable diagnostics](#)

show system pluggable diagnostics

Overview This command displays diagnostic information about pluggable transceivers that support Digital Diagnostic Monitoring (DDM). Different types of pluggable transceivers are supported in different device models. See your device's Datasheet for more information about the models of pluggables that your device supports.

For information on filtering and saving command output, see the **"Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide**.

Syntax show system pluggable [*<port-list>*] diagnostics [dbm]

Parameter	Description
<i><port-list></i>	The ports to display information about. The port list can be: • a single port (e.g. port1.0.25) • a continuous range of ports separated by a hyphen (e.g. port1.0.25-port1.0.26) • a comma-separated list of ports and port ranges (e.g. port1.0.25,port1.0.26)
dbm	This option shows TX and RX power values in dBm instead of mW for the transceivers.

Mode User Exec and Privileged Exec

Usage notes Diagnostic monitoring features allow you to monitor real-time parameters of the pluggable transceiver, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage. Additionally, RX LOS (Loss of Signal) is shown when the received optical level is below a preset threshold. Monitor these parameters to check on the health of all transceivers, selected transceivers or a specific transceiver installed in a device.

Examples To display detailed information about all pluggable transceivers installed on a standalone device, use the command:

```
awplus# show system pluggable diagnostics
```

Output The following shows typical output.

Example output from the show system pluggable diagnostics command on a device

```
awplus#show system pluggable diagnostics

System Pluggable Information Diagnostics

port1.0.25  Status           Alarms           Warnings
           Reading Alarm      Max      Min      Warning      Max      Min
Temp: (Degrees C) 44.871 - 100.00 -40.00 - 95.000 -30.00
Vcc: (Volts)      3.3043 - 3.4650 3.1350 - 3.4000 3.2000
Tx Bias: (mA)      3.468 - 13.264 0.000 - 10.264 0.264
Tx Power: (mW)     0.2376 - 0.7943 0.0562 - 0.6310 0.0708
Rx Power: (mW)     0.2104 - 1.0000 0.0126 - 0.7943 0.0200
Rx LOS:           Rx Up

...
```

Output The following shows typical output.

Example output from the show system pluggable diagnostics dbm command on a device showing dBm instead of the default mW.

```
awplus#show system pluggable diagnostics dbm

System Pluggable Information Diagnostics

port1.0.25  Status           Alarms           Warnings
           Reading Alarm      Max      Min      Warning      Max      Min
Temp: (Degrees C) 32.691 - 100.00 -40.00 - 85.000 -10.00
Vcc: (Volts)      3.378 - 3.630 2.970 - 3.465 3.135
Tx Bias: (mA)      2.819 - 6.00 1.000 - 5.000 1.000
Tx Power: (dBm)    4.66 - 10.41 -2.22 - 10.00 -0.71
Rx Power: (dBm)    2.28 - 12.55 - - 10.00 -6.99
Rx LOS:           Rx Up

...
```

Parameters in the output from the show system pluggable diagnostics command

Parameter	Description
Temp (Degrees C)	Shows the temperature inside the transceiver.
Vcc (Volts)	Shows voltage supplied to the transceiver.
Tx Bias (mA)	Shows current to the Laser Diode in the transceiver.
Tx Power (mW)	Shows the amount of light transmitted from the transceiver.
Rx Power (mW)	Shows the amount of light received in the transceiver.
Rx LOS	Rx Loss of Signal. This indicates whether: • light is being received (Rx Up) and therefore the link is up, or • light is not being received (Rx Down) and therefore the link is down

Related commands [show system environment](#)
[show system pluggable](#)
[show system pluggable detail](#)

Command changes Version 5.5.4-0.1: **dbm** parameter added

show test cable-diagnostics tdr

Overview Use this command to display the results of the last cable-diagnostics test that was run using the TDR (Time Domain Reflectometer) on a fixed copper cable port.

The displayed status of the cable can be either:

- OK
- Open
- Short (within-pair)
- Short (across-pair)
- Error

Syntax show test cable-diagnostics tdr

Mode Privileged Exec

Examples To show the results of a cable-diagnostics test use the following command:

```
awplus# show test cable-diagnostics tdr
```

Output The following shows typical output.

Example output from the show test cable-diagnostics tdr command

Port	Pair	Length	Status
port1.0.1	A	-	OK
	B	-	OK
	C	-	OK
	D	-	OK

Related commands [clear test cable-diagnostics tdr](#)
[test cable-diagnostics tdr interface](#)

test cable-diagnostics tdr interface

Overview Use this command to apply the Cable Fault Locator's cable-diagnostics tests to twisted pair data cables for a selected port. The tests will detect either correct, short circuit, or open, circuit terminations. For more information on running the CFL, see the [Pluggables and Cabling Feature Overview and Configuration Guide](#).

The test can take several seconds to complete. See the related show command to display the test results.

A new test can only be started if no other test is in progress. CFL cannot run on a port that is currently supplying power via PoE.

The displayed status of the cable can be either, OK, Short (within-pair), or Open. The "Open" or "Short" status is accompanied with the distance from the source port to the incorrect termination.

Syntax test cable-diagnostics tdr interface *<interface>*

Parameter	Description
cable-diagnostics	The cable diagnostic tests.
tdr	Time Domain Reflectometry.
interface	Selects the interface to test.
<i><interface></i>	Interface number of the port to be tested, e.g. port1.0.2.

Mode Privileged Exec

Example To run a cable test on the cable inserted into port1.0.1 use the following command:

```
awplus# test cable-diagnostics tdr interface port1.0.1
```

You will receive the following message:

```
Link will go down while test is in progress. Continue? (y/n): y
Select y to continue.
```

```
awplus# y
```

You will then receive the following message:

```
Test started. This will take several seconds to complete. Use
"show test cable-diagnostics tdr" to print results.
```

Related commands [clear test cable-diagnostics tdr](#)
[show test cable-diagnostics tdr](#)

8

Connectivity Fault Management Commands

- Contents**
- **Introduction** on page 320
 - **cc interval** on page 321
 - **cc multicast** on page 323
 - **cc unicast** on page 325
 - **clear (MEP Attribute)** on page 326
 - **clear ethernet cfm errorlog** on page 327
 - **clear mep counter** on page 328
 - **ethernet cfm domain-name** on page 329
 - **ethernet cfm mep** on page 333
 - **mep (FNG attributes)** on page 336
 - **mep active** on page 338
 - **mep ccm-ltm-priority** on page 340
 - **mep crosscheck** on page 342
 - **service ma-name** on page 345
 - **show ethernet cfm details** on page 349
 - **show ethernet cfm domain** on page 353
 - **show ethernet cfm errorlog** on page 356
 - **show ethernet cfm maintenance-points local mep** on page 359
 - **show ethernet cfm maintenance-points remote mep** on page 364
 - **show ethernet cfm service** on page 368
 - **show mep-alarm status** on page 371

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Connectivity Fault Management.

For more information, see the **Connectivity Fault Management (CFM) Feature Overview and Configuration Guide**.

cc interval

Overview Use this command to set the CCM Interval.

Syntax `cc ma-name <ma-name> interval <interval>`

Parameter	Description
ma-name	Specify the Maintenance Association for which the Interval is used.
<ma-name>	Specify the Maintenance Association's CLI instance name.
interval	Specify the CCM Interval.
<interval>	Specify the CCM Interval (CCI), using one of the following: 1 - CCI of 3 milliseconds (currently not supported) 2 - CCI of 10 milliseconds (currently not supported) 3 - CCI of 100 milliseconds 4 - CCI of 1 second 5 - CCI of 10 seconds 6 - CCI of 1 minute 7 - CCI of 10 minutes.

Default The default interval is 4 (1 second).

Mode Ethernet CFM Configuration

Usage notes Continuity Checks is another term for connectivity fault detection. This makes use of Continuity Check Messages (CCMs) that are periodically sent by an MEP (multicast or unicast) and received by other MEP(s). CCMs can be used to detect connectivity faults across a link (using Link Level MEPs) or across a segment of a VLAN using VLAN aware MEPs, both of which are used within an MD/MA. CCMs are sent periodically at a given rate (or frame interval) that is agreed upon by all the MEPs in the MA. The faster the rate, the more quickly faults can be detected.

If an MEP does not receive a CCM within 3.5 times the expected interval from a peer MEP(s), that MEP declares a connectivity fault. This is known as a "defect". Upon detecting a defect, the detecting MEP will also set the Remote Defect Indicator (RDI) bit for its outgoing CCM messages to its peer MEP(s) so as to notify the peer MEPs that a defect has been detected. If the defect persists long enough (generally 2.5 seconds), then an "alarm" is declared. If an alarm is declared, then the defect has to abate long enough (generally 10 seconds) for the alarm to clear.

Example To set the CCM interval of a Maintenance Association named "MA-INST2-1" to the value of "4", use the commands:

```
awplus(config)# ethernet cfm domain-name MD-INST2
awplus(config-ether-cfm)# cc ma-name MA-INST2-1 interval 4
```

Related commands **ethernet cfm domain-name**
service ma-name

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

cc multicast

Overview Use this command to enable a Local MEP to send CCMs using multicast, or to disable sending CCMs altogether.

Syntax `cc multicast state {enable|disable}`

Parameter	Description
state	Specify to either enable or disable CFM multicast CCMs.
enable	Start sending periodic multicast frames.
disable	Stop sending multicast frames.

Default Multicast is disabled by default.

Mode Interface Ethernet CFM MEP Configuration

Usage notes Continuity Checks is another term for connectivity fault detection. This makes use of Continuity Check Messages (CCMs) that are periodically sent by an MEP (multicast or unicast) and received by other MEP(s). CCMs can be used to detect connectivity faults across a link (using Link Level MEPs) or across a segment of a VLAN using VLAN aware MEPs, both of which are used within an MD/MA. CCMs are sent using multicast or unicast (but not both).

In order to enable a Local MEP to send, the Local MEP's "active" administrative state must be set to true, using the command **mep active**.

Example To configure a Local MEP to send CCMs using multicast, use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# cc multicast state enable
```

Related commands **ethernet cfm domain-name**
ethernet cfm mep
service ma-name

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

cc unicast

Overview Use this command to enable a Local MEP to send CCMs using unicast, or to disable sending CCMs altogether.

Syntax `cc unicast rmpid <rmep-id> state {enable|disable}`

Parameter	Description
rmpid	The remote MEP that the Local MEP is to unicast to.
<rmep-id>	The remote MEP ID in the range 1-8191.

Mode Interface Ethernet CFM MEP Configuration

Usage notes Continuity Checks is another term for connectivity fault detection. This makes use of Continuity Check Messages (CCMs) that are periodically sent by an MEP (multicast or unicast) and received by other MEP(s). CCMs can be used to detect connectivity faults across a link (using Link Level MEPs) or across a segment of a VLAN using VLAN aware MEPs, both of which are used within an MD/MA. CCMs are sent using multicast or unicast (but not both).

In order to enable a Local MEP to send, the Local MEP's "active" administrative state must be set to true, using the command **mep active**.

In order to send unicast CCMs, the Remote MEP has to be configured along with its MAC address.

Example To configure a Local MEP to send CCMs using unicast, use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# cc unicast rmpid 21 state enable
```

Related commands **ethernet cfm domain-name**
ethernet cfm mep
mep crosscheck
service ma-name

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

clear (MEP Attribute)

Overview Use this command to clear a Local MEP attribute.

Syntax `clear {ccm-ltm-priority|lowest-priority-defect|fng-alarm-time |
reset-fng-time|active|all}`

Parameter	Description
ccm-ltm-priority	Set the queuing and p-bit priority for CCM messages to their default value of 7.
lowest-priority-defect	Set the Fault Notification Generation (FNG) lowest alarm priority defect to the default value of 2.
fng-alarm-time	Set the Fault Notification Generation (FNG) time for a defect to be present before an alarm is raised to the default value of 2.5 seconds.
reset-fng-time	Set the Fault Notification Generation (FNG) time for a defect to abate before an alarm is cleared to the default value of 10 seconds.
active	Set the Local MEP's Active state to the default value of False, which sets the Local MEP's Administrative State to Down.
all	Set all of the above attributes to their default values.

Mode Interface Ethernet CFM MEP Configuration

Example To set the active state of the Local MEP to False, use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# clear active
```

Related commands [ethernet cfm domain-name](#)
[ethernet cfm mep](#)
[mep \(FNG attributes\)](#)
[service ma-name](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

clear ethernet cfm errorlog

Overview Use this command to clear the Event List for all Maintenance Associations (MAs) associated with the specified Maintenance Domain (MD).

Syntax clear ethernet cfm errorlog domain *<domain-name>*

Parameter	Description
<i><domain-name></i>	Specify the domain name

Mode Privileged Exec

Usage notes When a new error is detected for an MA that is associated with an MD, and the error is due to an error from a received or missing CCM from a Remote MEP, an event is logged to the CFM Errors Event List.

Example To clear the event list for all MA's associated with an MD named "MD-INST2", use the command:

```
awplus# clear ethernet cfm errorlog domain MD-INST2
```

Related commands [show ethernet cfm errorlog](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

clear mep counter

Overview Use this command to clear statistics counters for all Local MEPs within a given Maintenance Association (MA) and its associated Maintenance Domain (MD), or to optionally clear counters for one specific Local MEP.

Syntax `clear mep counter domain <domain-name> service <ma-name> [mep <mep-id>]`

Parameter	Description
domain	Specify the Maintenance Domain that Local MEP(s) are to have their counters cleared for. Both domain and service must be specified.
<domain-name>	Specify the Maintenance Domain's CLI instance name.
service	Specify the Maintenance Association that the Local MEP(s) are to have their counters cleared for. Both domain and service must be specified.
<ma-name>	Specify the CLI name that identifies the service (Maintenance Association (MA)) instance.
mep	Specify one specific Local MEP.
<mep-id>	Specify the Local MEP instance by MEP-id.

Mode User Exec/Privileged Exec

Example To clear the statistic counter for an MEP with the MEP ID "12", use the command:

```
awplus# clear mep counter domain MD-INST1 service MA-INST1-1 mep 12
```

Related commands [show ethernet cfm maintenance-points local mep](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

ethernet cfm domain-name

Overview Use this command to create and configure a CFM Maintenance Domain, or to enter Ethernet CFM Configuration mode for an existing Maintenance Domain instance.

Use the **no** variant of this command to destroy the Maintenance Domain's instance that was previously created.

Syntax ethernet cfm domain-name <domain-name>
 ethernet cfm domain-name <domain-name> md-type character-string
 md-type-name <md-type-name> level <level> [mip-creation none]
 ethernet cfm domain-name <domain-name> md-type dns-based md-
 type-name <md-type-name> level <level> [mip-creation none]
 ethernet cfm domain-name <domain-name> md-type mac md-type-name
 <md-type-name> level <level> [mip-creation none]
 ethernet cfm domain-name <domain-name> md-type no-name level
 <level> [mip-creation none]
 no ethernet cfm domain-name <domain-name>

Parameter	Description
<domain-name>	The name that identifies this Maintenance Domain instance. If creating this instance, specify the remaining parameters. If re-entering configuration mode for this instance, use this parameter to identify this instance, and do not enter the remaining parameters.
md-type	Specify the name type. The MD name part of the MAID field may or may not appear in the CCM message. There are different formats and conventions for the name depending on type.
character-string	Specify the md-type as Character String-based MD name format. The <md-type-name> is a character string of 1 to 43 characters. This character string plus the Short MA name that is configured for an MA make up the MAID field in a CCM message.
md-type-name	The Maintenance Domain type.
<md-type-name>	The value of the MD type name, which depends on the md-type selected.
dns-based	Specify the md-type as DNS-based MD name format. The <md-type-name> is a Domain Name like string of 1 to 43 characters. This is a globally unique text string derived from a DNS name. This DNS based string plus the Short MA name that is configured for an MA make up the MAID field in a CCM message.
mac	Specify the md-type as MAC-based MD name format. The <md-type-name> consists of a MAC address + 2-octet (unsigned) integer in the form of HHHH.HHHH.HHHH:<2-octet integer>. This MAC based string plus the Short MA name that is configured for an MA make up the MAID field in a CCM message.
no-name	Specify the md-type whereby no MD name is to appear in the CCM message.
level	Specify the Level the Domain operates in.

Parameter	Description
<level>	0 to 7.
mip-creation	Optional parameter that specifies the MIP creation permission value.
none	Specifies that no MIPs are to be created (default and only choice).

Mode Global Configuration

Usage notes A Maintenance Domain is a Connectivity Fault Management (CFM) term that represents the administrative area of a network from which an operator can manage VLANs that traverse their area. An MD can also be scoped to a simple Ethernet link. To differentiate different administrative areas, an MD is made up of a name and a level. As part of CFM, a Connectivity Check Message (CCM) is used to detect Ethernet connectivity faults amongst nodes that participate in CFM. CCM messages carry the MD name within the MAID field as well as carries the level of the MD.

This command is used to configure the MD name, which can be chosen from a variety of name format types, as well as the level.

Example To create a Maintenance Domain instance named "MD-INST2" with a character string-based name of "MD-12L3" and a level of 3, use the command:

```
awplus(config)# ethernet cfm domain-name MD-INST2 md-type  
character-string md-type-name MD-12L3 level 3
```

To enter Ethernet CFM Configuration mode for an existing MD instance named "MD-INST2", use the command:

```
awplus(config)# ethernet cfm domain-name MD-INST2  
awplus(config-ether-cfm)#
```

To destroy a Maintenance Domain instance named "MD-INST2", use the command:

```
awplus(config)# no ethernet cfm domain-name MD-INST2
```

Related commands

- cc interval**
- cc multicast**
- cc unicast**
- cfm-sf-notify**
- clear (MEP Attribute)**
- ethernet cfm mep**
- mep (FNG attributes)**
- mep crosscheck**
- service ma-name**
- show ethernet cfm domain**
- show ethernet cfm errorlog**
- show ethernet cfm maintenance-points remote mep**
- show ethernet cfm service**

Command changes

- Version 5.4.7-1.1: command added
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

ethernet cfm mep

Overview Use this command to create a Local MEP instance, or to enter Interface Ethernet CFM MEP Configuration mode for an existing Local MEP's instance, so you can configure it.

Use the **no** variant of this command to destroy the Local MEP instance.

Syntax ethernet cfm mep down mpid *<mep-id>* domain-name *<domain-name>*
ma-name *<ma-name>*
no ethernet cfm mep down mpid *<mep-id>* domain-name *<domain-name>*
ma-name *<ma-name>*

Parameter	Description
down	Specify the Local MEP as a Down MEP.
mpid	Specify the Local MEP ID.
<i><mep-id></i>	1-8191. This must be unique ID for all MEPs in the MA (both local and remote).
domain-name	Specify the Maintenance Domain that the Local MEP is to be associated with.
<i><domain-name></i>	Specify the Maintenance Domain's CLI instance name.
ma-name	Specify the Maintenance Association that the Local MEP is to be associated with.
<i><ma-name></i>	Specify the Maintenance Association's CLI instance name.

Mode Interface Configuration

Usage notes Maintenance Points are entities that exist within an MD/MA and can perform the CFM/802.1ag functions such as Continuity Checks for fault management. The main type of MP is a Maintenance End Point (MEP). This type of maintenance point sits at the edges of a Maintenance Domain but is a member of only one MA within the Maintenance Domain. Thus an MEP is used at the end of a VLAN segment, or it is used at the end of a link. MPs live on bridge ports and station ports. On a bridge port, there are two types.

- An Up Maintenance Entity is considered an inward MP. It communicates across the inside of the bridge to the other side, and this allows it to reach the outside world. It lives on a bridge port for a given VLAN, but it does not use this port to send or receive to get to the outside world. Instead, it sends and receives through the inside of the bridge and communicates to the outside world through the other VLAN port members. An Up MP cannot be used for Link Level CFM.
- A Down Maintenance Entity is considered an outward MP. It sends and receives only through its bridge port outwardly to the outside world, and does not communicate inside the bridge. A Down MP is not subject to blocking due to Spanning Tree Protocol (STP) or any other protocol trying to prevent loops in the network. As such, it is important that Down MPs be used in an MD/MA that is not subject to topology loops. A Down MP can be VLAN aware or link-local.

An MEP can be either Up or Down for a given MD/MA, but within a bridge for the same MD/MA, there can only be one Up or Down MEP (not both). An Up MEP must be VLAN aware. A Down MEP may be VLAN aware. Otherwise, a Down MEP is allowed to be link local (VLAN unaware), and its scope is that of the entire link.

AlliedWare Plus supports Down Maintenance Entities only.

Example To create a local MEP instance context with a domain name of "MD-INST2" and an MA name of "MA-INST2-1", use the commands:

```
awplus(config)# interface port1.0.2
```

```
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
```

To re-enter a local MEP instance context with the domain name "MD-INST2" and the MA name "MA-INST2-1", use the commands:

```
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
```

```
awplus(config-if-eth-cfm-mep)#
```

To destroy a local MEP instance context with the domain name "MD-INST2" and the MA name "MA-INST2-1", use the commands:

```
awplus(config-if)# no ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
```

Related commands

- cc multicast**
- cc unicast**
- cfm-sf-notify**
- clear (MEP Attribute)**
- ethernet cfm domain-name**
- mep (FNG attributes)**
- mep crosscheck**
- service ma-name**
- show ethernet cfm errorlog**
- show ethernet cfm maintenance-points remote mep**
- show ethernet cfm service**
- show mep-alarm status**

Command changes

- Version 5.4.7-1.1: command added
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

mep (FNG attributes)

Overview Use this command to configure the Fault Notification Generation (FNG) attributes of a Local MEP.

Syntax `mep {lowest-priority-defect <defect-priority>|
fng-alarm-time <soak-time>|reset-fng-time <abate-time>}`

Parameter	Description
lowest-priority-defect<defect-priority>	The lowest level defect allowed to generate alarms. An integer in the range 1 to 6. The default is 2.
fng-alarm-time <soak-time>	The time that the defects must be present before an alarm is generated. An integer in the range of 250 to 1000 in increments of 10 ms. The default is 250 (2.5 seconds).
reset-fng-time <abate-time>	The time that the defect must be absent before the alarm is cleared. An integer in the range of 250 to 1000 in increments of 10 ms. The default is 1000 (10 seconds).

Mode Interface Ethernet CFM MEP Configuration

Usage notes Maintenance Points are entities that exist within an MD/MA and can perform the CFM/802.1ag functions such as Continuity Checks for fault management. The main type of MP is a Maintenance End Point (MEP). This type of maintenance point sits at the edges of a Maintenance Domain but is a member of only one MA within the Maintenance Domain. Thus an MEP is used at the end of a VLAN segment, or it is used at the end of a link.

A Local MEP can detect defects in connectivity of a VLAN or a local link using Continuity Check Messages (CCM) by sending and receiving CCMs with Remote MEP peers. Any defects detected locally can also be conveyed to Remote MEP peers by sending a Remote Defect Indicator (RDI) to the peers within a Continuity Check Message (CCM). If defects persist long enough, an alarm can be generated.

Use this command to configure the following attributes of a Local MEP:

- Fault Notification Generation Lowest Alarm Priority Defect – the lowest defect priority that can cause an alarm to be raised. This configuration parameter specifies the lowest defect that has to occur before an alarm can be generated. Any priority less than this will not result in an alarm notification. Note that if a local defect is detected and its priority is not high enough to generate an alarm, then the Local MEP will not send an RDI to its Remote MEP peers, which is used to notify the peers of a connectivity fault. We recommend you keep the lowest alarm priority defect set to 2.
- Fault Notification Generation Alarm timers – the timers that determine whether a defect has been present long enough to result in an alarm being generated, or whether a defect has been abated for long enough to clear an alarm.

Example To clear an alarm after the defect has been abated for 6 seconds, use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# mep reset-fng-time 600
```

Related commands [clear \(MEP Attribute\)](#)
[ethernet cfm domain-name](#)
[ethernet cfm mep](#)
[service ma-name](#)
[show mep-alarm status](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

mep active

Overview Use this command to specify the administrative state of the Local MEP.

Syntax `mep active {true|false}`

Parameter	Description
true	Put the Local MEP into a state of active, which enables it to perform various functions such as processing CCM messages.
false	Specify the state of the Local MEP to cease functioning.

Default false

Mode Interface Ethernet CFM MEP Configuration

Usage notes Maintenance Points are entities that exist within an MD/MA and can perform the CFM/802.1ag functions such as Continuity Checks for fault management. The main type of MP is a Maintenance End Point (MEP). This type of maintenance point sits at the edges of a Maintenance Domain but is a member of only one MA within the Maintenance Domain. Thus an MEP is used at the end of a VLAN segment, or it is used at the end of a link.

A Local MEP can detect defects in connectivity of a VLAN or a local link using Continuity Check Messages (CCM) by sending and receiving CCMs with Remote MEP peers. Any defects detected locally can also be conveyed to Remote MEP peers by sending a Remote Defect Indicator (RDI) to the peers within a Continuity Check Message (CCM). If defects persist long enough, an alarm can be generated.

Setting the Local MEP's Administrative State to true enables it to perform various functions such as processing CCM messages. Setting the state to false deactivates the Local MEP.

Example To set the administrative state of the local MEP to "active", use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# mep active true
```

Related commands **clear (MEP Attribute)**
ethernet cfm domain-name
ethernet cfm mep
service ma-name
show mep-alarm status

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

mep ccm-ltm-priority

Overview Use this command to specify the queuing and p-bit priority for CCM messages.

Syntax mep ccm-ltm-priority <0-7>

Parameter	Description
<0-7>	The queuing and p-bit priority for CCM messages.

Default 7

Mode Interface Ethernet CFM MEP Configuration

Usage notes Maintenance Points are entities that exist within an MD/MA and can perform the CFM/802.1ag functions such as Continuity Checks for fault management. The main type of MP is a Maintenance End Point (MEP). This type of maintenance point sits at the edges of a Maintenance Domain but is a member of only one MA within the Maintenance Domain. Thus an MEP is used at the end of a VLAN segment, or it is used at the end of a link.

A Local MEP can detect defects in connectivity of a VLAN or a local link using Continuity Check Messages (CCM) by sending and receiving CCMs with Remote MEP peers. CCMs are high priority messages by default, but the priority is configurable, although we do not recommend changing it. Any defects detected locally can also be conveyed to Remote MEP peers by sending a Remote Defect Indicator (RDI) to the peers within a Continuity Check Message (CCM). If defects persist long enough, an alarm can be generated.

Example To set the queuing and p-bit priority for CCM messages to 6, use the commands:

```
awplus(config)# interface port1.0.2
awplus(config-if)# ethernet cfm mep down mpid 12 domain-name MD-INST2 ma-name MA-INST2-1
awplus(config-if-eth-cfm-mep)# mep ccm-ltm-priority 6
```

CCMs should be the highest priority message so we recommend leaving their priority as 7.

Related commands **clear (MEP Attribute)**
ethernet cfm domain-name
ethernet cfm mep
service ma-name
show mep-alarm status

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

mep crosscheck

Overview Use this command within the MD instance context to create a Remote MEP instance and configure its parameters.

Use the **no** variant of this command to destroy the Remote MEP instance.

Syntax `mep crosscheck mpid <rmep-id> ma-name <ma-name> [mac <HHHH.HHHH.HHHH>]`
`no mep crosscheck mpid <rmep-id> ma-name <ma-name>`

Parameter	Description
<code>mpid</code>	Specify the Remote MEP id.
<code><rmep-id></code>	1-8191. This must be unique ID for all MEPs in the MA (both local and remote).
<code>ma-name</code>	Specify the Maintenance Association that the Remote MEP is to be associated with.
<code><ma-name></code>	Specify the Maintenance Association's CLI instance name.
<code>mac</code>	Optionally, when using unicast for communication between a Local MEP and a Remote MEP, specify the remote MEP's MAC address.
<code><HHHH.HHHH.HHHH></code>	Specify the Remote MEP's MAC address using the HHHH.HHHH.HHHH format where H is a hexadecimal value.

Mode Ethernet CFM Configuration

Usage notes Maintenance Points are entities that exist within an MD/MA and can perform the CFM/802.1ag functions such as Continuity Checks for fault management. The main type of MP is a Maintenance End Point (MEP). This type of maintenance point sits at the edges of a Maintenance Domain but is a member of only one MA within the Maintenance Domain. Thus an MEP is used at the end of a VLAN segment, or it is used at the end of a link. MPs live on bridge ports and station ports. On a bridge port, there are two types.

- An Up Maintenance Entity is considered an inward MP. It communicates across the inside of the bridge to the other side, and this allows it to reach the outside world. It lives on a bridge port for a given VLAN, but it does not use this port to send or receive to get to the outside world. Instead, it sends and receives through the inside of the bridge and communicates to the outside world through the other VLAN port members. An Up MP cannot be used for Link Level CFM.
- A Down Maintenance Entity is considered an outward MP. It sends and receives only through its bridge port outwardly to the outside world, and does not communicate inside the bridge. A Down MP is not subject to blocking due to Spanning Tree Protocol (STP) or any other protocol trying to prevent loops in the network. As such, it is important that Down MPs be used in an MD/MA that is not subject to topology loops. A Down MP can be VLAN aware or link-local.

An MEP can be either Up or Down for a given MD/MA, but within a bridge for the same MD/MA, there can only be one Up or Down MEP (not both). An Up MEP must be VLAN aware. A Down MEP may be VLAN aware. Otherwise, a Down MEP is allowed to be link local (VLAN unaware), and its scope is that of the entire link.

Example To create a remote MEP instance named "MA-INST2-1" with an MEP ID of 21, use the command:

```
awplus(config-ether-cfm)# mep crosscheck mpid 21 ma-name MA-INST2-1
```

To destroy the remote MEP instance named "MA-INST2-1" with the MEP ID of 21, use the command:

```
awplus(config-ether-cfm)# no mep crosscheck mpid 21 ma-name MA-INST2-1
```

Related commands **cc unicast**
ethernet cfm domain-name

ethernet cfm mep

service ma-name

show ethernet cfm errorlog

show ethernet cfm maintenance-points remote mep

show ethernet cfm service

show mep-alarm status

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

service ma-name

Overview Use this command to create a Maintenance Association instance within the MD instance context and configure its parameters.

Use the **no** variant of this command to destroy the Maintenance Association instance.

Syntax service ma-name <ma-name> ma-type {icc|integer|primary-vid|
string|vpn-id} ma-type-name <ma-type-name> [vlan <primary-vid>
[mip-creation {none}]]
no service <ma-name>

Parameter	Description
<ma-name>	The CLI name that identifies this Maintenance Association (MA) instance.
ma-type	Specify the MA name type. The MA name part of the MAID field appears in the CCM message. There are different formats and conventions for the name depending on the type.
icc	Specify the ma-type as ICC based MA name format. The <ma-type-name> is a 13 byte character string consisting of a 1 to 6 character ITU Carrier Code (ICC) plus a 1 to 6 character Unique MEGID (UMC) code for the name. Any remaining characters are padding out with NULLs by the system to fill out the 13 bytes. This can only be used with Maintenance Domain whose name md-type is set to "No name".
integer	Specify the ma-type as Integer based MA name format. The <ma-type-name> is a number up to 2 Bytes (0..65535).
primary-vid	Specify the ma-type as Primary VLAN-id based MA name format. The <ma-type-name> is the VLAN id number that has been assigned to the MA as the primary VLAN.
string	Specify the ma-type as Character String based MA name format. The <ma-type-name> is a string of 1 to 45 characters.
vpn-id	Specify the ma-type as an RFC2685 VPN ID based MA name format. The <ma-type-name> is a 7 Byte value divided into two parts. The first part makes up the VPN's OUI which is three octets and the remaining four octets make up the VPN Index. The format is HHHHHH.HHHHHHHH where H is a hexadecimal digit.
ma-type-name	The Maintenance Association (MA) name type.
<ma-type-name>	The value of the MA type name, which depends on the ma-type selected (icc, integer, primary-vid, string, vpn-id).
vlan	An optional parameter that specifies the VLAN.
<primary-vid>	Specify the ID of the primary VLAN in the MA.
mip-creation	Optional parameter that specifies the MIP creation permission value.

Parameter	Description
none	Specifies that no MIPs are to be created (the default and only choice).

Mode Ethernet CFM Configuration

Usage notes A Maintenance Association is a Connectivity Fault Management (CFM) term that represents a particular segment of a network within a Maintenance Domain. An MA can represent a segment of a VLAN that is managed for connectivity within that segment. As a VLAN is often the granularity that a Network Service Provider sells to their customer, an MA is often referred to as a "Service". An MA can also be used to represent a link and in this case the MA is VLAN unaware.

As part of CFM, a Connectivity Check Message (CCM) is used to detect Ethernet connectivity faults amongst nodes that participate in CFM. CCM messages carry the MA name within the MAID field. Within an MD instance context, this command is used to configure the MA name, which can be chosen from a variety of format types.

Example To create a Maintenance Association instance named "MA-INST2-1" with an MA name type of "string" and value of "MA-12V100", use the command:

```
awplus(config-ether-cfm)# service ma-name MA-INST2-1 ma-type  
string ma-type-name MA-12V100
```

To destroy a Maintenance Association instance named "MA-INST2-1", use the command:

```
awplus(config-ether-cfm)# no service MA-INST2-1
```

Related commands

- cc interval**
- cc multicast**
- cc unicast**
- cfm-sf-notify**
- clear (MEP Attribute)**
- ethernet cfm domain-name**
- ethernet cfm mep**
- mep (FNG attributes)**
- mep crosscheck**
- show ethernet cfm domain**
- show ethernet cfm errorlog**
- show ethernet cfm maintenance-points remote mep**
- show ethernet cfm service**

Command changes Version 5.4.7-1.1: command added
 Version 5.4.8-0.2: added to SBx8100 series products
 Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm details

Overview Use this command to show CFM configuration, status, and statistics in detail for all CFM entities that the system knows about.

Syntax show ethernet cfm details

Mode User Exec/Privileged Exec

Example To show CFM configuration, status, and statistics in detail for all CFM entities, use the command:

```
awplus# show ethernet cfm details
```

The output loops through the hierarchy of MDs, then MAs within each MD, then local MEPs within that MA, and finally remote MEPs within that MA.

Output The following shows typical output.

Example output from show ethernet cfm details

```
awplus#show ethernet cfm details

=====
Maintenance Domain
=====
Maintenance Domain Name..... MD-INST1
Maintenance Domain Name Format... character-string
Maintenance Domain Name Value.... MD-12L3
Level..... 3
Associated CFM Services..... (VLAN 400 ): MA-INST1-1
                             (VLAN 300 ): MA-INST1-2
MIP Creation..... None

Service
-----
CFM Service Name..... MA-INST1-1
CFM Domain Name..... MD-INST1
CFM Domain Level..... 3
Primary VLAN..... 400
Maintenance Assoc Name Format.... string
Maintenance Assoc Name Value..... MA-12V400
CCM Transmission Interval..... 1 second
Local MEPS..... MEP DOWN
                             2 (interface port1.0.3)
Configured Remote MEPS..... 102
Missing Remote MEPS..... None
Current MEP Defects..... -
MIP Creation..... None

Local Maintenance End Point
-----
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-1
MA Primary VLAN..... 400
MEP ID..... 2
Direction..... Down
Interface..... port1.0.3
    MEP Active State..... True
    CC State..... Enabled
    CC Type..... Multicast
    PDU VLAN Priority..... 7
    MAC-address..... eccd.6dc9.bef6
    Tx-RDI..... False
    Current Defects..... -
    Current Highest Defect Alarm.. -
    Alarm Minimum Defect..... 2 (someMACstatusDefect)
    Alarm Trip Time..... AUTO (2.5 seconds)
    Alarm Reset Time..... AUTO (10 seconds)
    Configured Remote MEPS..... 102
    Missing Remote MEPS..... None
    Error CCM Reason..... N/A
    Last Error CCM..... N/A
    Cross-connect Defect Reason... N/A
    Last Cross Connect CCM..... N/A

Counters
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-1
MA Service VLAN..... 400
MEP ID..... 2
Direction..... DOWN
Interface..... port1.0.3
    Tx CCM Count..... 0
    Rx Out-of-Sequence CCM..... 0

Remote Maintenance End Point
```

```

-----
CFM Service Name..... MA-INST1-1
CFM Domain Name..... MD-INST1
Remote MEPID..... 102
Receiving CCMs..... Wait
Rx RDI..... -
MAC Address..... -
Port Status..... -
Interface Status..... -

Service
-----
CFM Service Name..... MA-INST1-2
CFM Domain Name..... MD-INST1
CFM Domain Level..... 3
Primary VLAN..... 300
Maintenance Assoc Name Format.... string
Maintenance Assoc Name Value..... MA-12V300
CCM Transmission Interval..... 1 second
Local MEPs..... MEP DOWN
1 (interface port1.0.1)
MEP DOWN
200 (interface port1.0.2)
Configured Remote MEPs..... 101,1001
Missing Remote MEPs..... 101,1001
Current MEP Defects..... 3 (someMEPCCMdefect)
MIP Creation..... None

Local Maintenance End Point
-----
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-2
MA Primary VLAN..... 300
MEP ID..... 1
Direction..... Down
Interface..... port1.0.1
    MEP Active State..... True
    CC State..... Enabled
    CC Type..... Multicast
    PDU VLAN Priority..... 7
    MAC-address..... eccd.6dc9.bef6
    Tx-RDI..... True
    Current Defects..... 3 (someMEPCCMdefect)
    Current Highest Defect Alarm.. 4 (someMEPCCMdefect)
    Alarm Minimum Defect..... 2 (someMACstatusDefect)
    Alarm Trip Time..... AUTO (2.5 seconds)
    Alarm Reset Time..... AUTO (10 seconds)
    Configured Remote MEPs..... 101,1001
    Missing Remote MEPs..... 101,1001
    Error CCM Reason..... N/A
    Last Error CCM..... N/A
    Cross-connect Defect Reason... N/A
    Last Cross Connect CCM..... N/A

Counters
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-2
MA Service VLAN..... 300
MEP ID..... 1
Direction..... DOWN
Interface..... port1.0.1
    Tx CCM Count..... 121
    Rx Out-of-Sequence CCM..... 0

Local Maintenance End Point
-----
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-2
MA Primary VLAN..... 300
MEP ID..... 200
Direction..... Down
Interface..... port1.0.2

```

```

MEP Active State..... True
CC State..... Enabled
CC Type..... Multicast
PDU VLAN Priority..... 7
MAC-address..... eccd.6dc9.bef6
Tx-RDI..... True
Current Defects..... 3 (someRMEPCCMdefect)
Current Highest Defect Alarm.. 4 (someRMEPCCMdefect)
Alarm Minimum Defect..... 2 (someMACstatusDefect)
Alarm Trip Time..... AUTO (2.5 seconds)
Alarm Reset Time..... AUTO (10 seconds)
Configured Remote MEPs..... 101,1001
Missing Remote MEPs..... 101,1001
Error CCM Reason..... N/A
Last Error CCM..... N/A
Cross-connect Defect Reason... N/A
Last Cross Connect CCM..... N/A

Counters
Domain Name..... MD-INST1
MA Service Name..... MA-INST1-2
MA Service VLAN..... 300
MEP ID..... 200
Direction..... DOWN
Interface..... port1.0.2
Tx CCM Count..... 0
Rx Out-of-Sequence CCM..... 0

Remote Maintenance End Point
-----
CFM Service Name..... MA-INST1-2
CFM Domain Name..... MD-INST1
Remote MEPID..... 101
Receiving CCMS..... Fail
Rx RDI..... -
MAC Address..... -
Port Status..... -
Interface Status..... -

Remote Maintenance End Point
-----
CFM Service Name..... MA-INST1-2
CFM Domain Name..... MD-INST1
Remote MEPID..... 1001
Receiving CCMS..... Fail
Rx RDI..... -
MAC Address..... -
Port Status..... -
Interface Status..... -

```

Related commands [show ethernet cfm domain](#)
[show ethernet cfm maintenance-points local mep](#)
[show ethernet cfm maintenance-points remote mep](#)
[show ethernet cfm service](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm domain

Overview Use this command to show the Ethernet CFM Domain(s) that have been configured in summary format. Options include the ability to show all domains with detailed information, or to show a specified domain with detailed information.

Syntax show ethernet cfm domain
show ethernet cfm domain details
show ethernet cfm domain <domain-name> details

Parameter	Description
<domain-name>	The CLI name that identifies this Maintenance Domain instance.
details	Provide detailed information in the output.

Mode Privileged Exec

Example To show all domain configurations in summary format, use the command:

```
awplus# show ethernet cfm domain
```

To show all domains in detail, use the command:

```
awplus# show ethernet cfm domain details
```

To show a specific domain named "MD-INST1" in detail, use the command:

```
awplus# show ethernet cfm domain MD-INST1 details
```

Output The following shows typical output.

Example output from show ethernet cfm domain

```
awplus#show ethernet cfm domain

CFM Domain Name                      Level
-----
MD-INST1                             0
MD-INST2                             3
```

Parameters in the output from show ethernet cfm domain

Parameter	Description
CFM Domain Name	The Maintenance Domain name for the managed object.
Level	The level for the domain.

Example output from show ethernet cfm domain details

```
awplus#show ethernet cfm domain details

Maintenance Domain Name..... MD-INST1
Maintenance Domain Name Format... character-string
Maintenance Domain Name Value... MD-12L0
Level..... 0
Associated CFM Services..... (Link Level ): MA-INST1-1
MIP Creation..... None
-----
Maintenance Domain Name..... MD-INST2
Maintenance Domain Name Format... character-string
Maintenance Domain Name Value... MD-12L3
Level..... 3
Associated CFM Services..... (Link Level ): MA-INST2-1
MIP Creation..... None
-----
```

Example output from show ethernet cfm domain MD-INST1 details

```
awplus#show ethernet cfm domain MD-INST1 details

Maintenance Domain Name..... MD-INST1
Maintenance Domain Name Format... character-string
Maintenance Domain Name Value... MD-12L0
Level..... 0
Associated CFM Services..... (Link Level ): MA-INST1-1
MIP Creation..... None
-----
```

Parameters in the output from show ethernet cfm domain details

Parameter	Description
Domain Name	The Maintenance Domain name for the managed object.

Parameter	Description
Domain Name Format and Value	The Maintenance Domain Name Format and Value. The format is one of the following: character-stringDNSMACNo name
Level	The level for the domain.
Associated CFM Services	The Maintenance Associations (MA) instance names.
MIP Creation	The MIP creation value.

Related commands [ethernet cfm domain-name](#)
[service ma-name](#)
[show ethernet cfm details](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm errorlog

Overview Use this command to list the CFM Errors that are in the CFM Errors Event List, starting from the oldest at the top to the latest at the end.

Syntax show ethernet cfm errorlog domain *<domain-name>*

Parameter	Description
<i><domain-name></i>	Specify the domain name value.

Mode Privileged Exec

Usage notes When a new error is detected for a Maintenance Association (MA) that is associated with a Maintenance Domain (MD), and such is due to an error from a received or missing CCM from a Remote MEP, an event is logged to the CFM Errors Event List.

Example To show the list of errors for an MD named "MD-INST2", use the command:
awplus# show ethernet cfm errorlog domain MD-INST2

Output The following shows typical output.

Example output from show ethernet cfm errorlog domain MD-INST2

```
awplus#show ethernet cfm errorlog domain MD-INST2
```

CFM Service Name	Level	VLAN	MEPID	Remote MAC	Error Reason
MA-INST2-1	0	0	12	0000.0000.0000	Remote MEP Down

Parameters in the output from show ethernet cfm errorlog domain MD-INST2

Parameter	Description
Level	The level configured for the MD.
VLAN	The VLAN ID used by the MA if any, otherwise is "0".
MEPID	The MEP ID of the local MEP that detected the error.
Remote MAC	The source MAC address of the received CCM causing the error if known, 0000.0000.0000 otherwise.
Error Reason	One of the following: "Remote MEP Down" - an RMEPCCMDefect has been declared for this remote MEP. CCMs have not been received from this remote MEP within the CCM interval. "MEP Configuration" - the CCM received from the remote MEP has the same MEP ID as the local MEP that received the CCM. For unicast remote MEPs this error can also indicate that even though the CCM received from the remote MEP has an MEP ID that matches a configured remote MEP ID in the MA, the source MAC address differs from the configured MAC address for that remote MEP. "Forwarding Loop" - the CCM received from the remote MEP has an MEP ID that matches a configured local MEP ID in the MA, and also has the same source MAC address as the local MEP's MAC address that received the CCM. "Cross Connected" - a xconCCMdefect was detected.
CFM Service Name	The name of the MA associated with the MD for this error(s).

Related commands

- [clear ethernet cfm errorlog](#)
- [ethernet cfm domain-name](#)
- [ethernet cfm mep](#)
- [mep crosscheck](#)
- [service ma-name](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm maintenance-points local mep

Overview Use this command to show one or more Local MEPs, and their configuration and status in summary format. Options include the ability to show Local MEP(s) for a given interface with further option to show statistics counters. Another option is to show Local MEPs for a given Maintenance Association (MA) and Maintenance Domain (MD) either for statistics counters, or for one specific Local MEP with either detailed information or statistics counters.

Syntax `show ethernet cfm maintenance-points local mep interface <port> [counters]`
`show ethernet cfm maintenance-points local mep domain <domain-name> service <ma-name> [counters]`
`show ethernet cfm maintenance-points local mep domain <domain-name> service <ma-name> mep <mep-id> {details|counters}`

Parameter	Description
interface	Specify the interface for which Local MEP(s) are to be shown.
<interface-name>	Specify the interface by name.
counters	Specify that counter statistics are to be shown.
domain	Specify the Maintenance Domain that Local MEP(s) are to be shown for. Both this and service must be specified.
<domain-name>	Specify the Maintenance Domain's CLI instance name.
service	Specify the Maintenance Association that the Local MEP(s) are to be shown for. Both this and domain must be specified.
<ma-name>	Specify CLI name that identifies the service (Maintenance Association (MA)) instance of interest.
mep	Specify one particular Local MEP of interest.
<mep-id>	Specify the Local MEP instance by MEP-id.
details	Specify that details are to be included in the output.

Mode User Exec/Privileged Exec

Examples To show the configuration and status of all the Local MEP(s) on an interface, use the command:

```
awplus# show ethernet cfm maintenance-points local mep interface  
port1.0.2
```

To show details of a specific Local MEP on an MA and its associated MD, use the command:

```
awplus# show ethernet cfm maintenance-points local mep domain  
MD-INST1 service MA-INST1-1 mep 12 details
```

Output The following shows typical output.

Example output from show ethernet cfm maintenance-points local mep interface port1.0.2

```
awplus#show ethernet cfm maintenance-points local mep
interface port1.0.2
```

Service Name	MEPID	Dir	Interface	State	Defect
MA-INST1-1	12	D	port1.0.2	En	..3..

Parameters in the output from show ethernet cfm maintenance-points local mep interface <interface-name>

Parameter	Description
Service Name	The MA service name.
MEPID	The MEP ID of the local MEP of interest within the MA.
Dir	The direction of this local MEP:D - Down MEP.U - Up MEP.Note: Only Down is currently supported.
Interface	The interface on which the local MEP resides.
State	Whether the local MEP's CCM processing is enabled "En" or disabled "Dis".
Defect	Defect bit list <dbl> indicating which of 5 possible defects are currently being detected with each bit showing the detected <defect-number> or . if there is no defect.

Example output from show ethernet cfm maintenance-points local mep domain MD-INST1 service MA-INST1-1 mep 12 details

```
awplus#show ethernet cfm maintenance-points local mep domain MD-INST1
service MA-INST1-1 mep 12 details
```

Domain Name.....	MD-INST1
MA Service Name.....	MA-INST1-1
MA Primary VLAN.....	0
MEP ID.....	12
Direction.....	Down
Interface.....	port1.0.2
MEP Active State.....	True
CC State.....	Enabled
CC Type.....	Multicast
PDU VLAN Priority.....	7
MAC-address.....	000c.2526.95a1
Tx-RDI.....	True
Current Defects.....	3 (someRMEPCCMdefect)
Current Highest Defect Alarm..	4 (someRMEPCCMdefect)
Alarm Minimum Defect.....	2 (someMACstatusDefect)
Alarm Trip Time.....	AUTO (2.5 seconds)
Alarm Reset Time.....	AUTO (10 seconds)

```
Configured Remote MEPs..... 21
Missing Remote MEPs..... 21
Error CCM Reason..... N/A
Last Error CCM..... N/A
Cross-connect Defect Reason... N/A
Last Cross Connect CCM..... N/A
```

Parameters in the output from show ethernet cfm maintenance-points local mep domain <domain-name> service <ma-name> mep <mep-id> details

Parameter	Description
Domain Name and MA Service Name	Uniquely identify the MD and MA this local MEP is associated with.
MA Primary VLAN	The VLAN used by this MEP. A link-local MEP VLAN is indicated by “-”.
MEP ID	The local MEP's ID.
Direction	The direction of the local MEP, either Down or Up.
Interface	The Interface port or Interface lag that the local MEP is configured against.
MEP Active State	The MEP's configured administrative state:Up: TrueDown: False.
CC State	The MEP's CCM configured administrative state:Up: EnableDown: Disable.
CC Type	The configured CCM sending and receiving type, either multicast or unicast. If not yet configured, it shows as None.
Tx-RDI	Whether this local MEP is sending RDI or not. An RDI is sent when one or more of the following defects have been declared by the local MEP:someRMEPCCMdefectsoneMACstatusDefecterrorCCMdefectxco
Current Defects	A list of defects the local MEP is currently detecting. It shows the defect(s), as both a defect priority and name.
Current Highest Defect Alarm	The highest defect priority that has been encountered while the local MEP has been in an alarm state.
Alarm Minimum Defect	The minimum defect the local MEP has to see before declaring an alarm.
Alarm Trip Time	The amount of time the defect has to exist before an alarm is declared.
Configured Remote MEP IDs	A comma separated list of configured remote MEPs (by MEP IDs) known by this local MEP. If the remote MEP also has a configured unicast MAC address, the MEP ID will also include -HHHH.HHHH.HHHH.

Parameter	Description
Missing Remote MEPs	The remote MEPs (by MEP ID) that have been configured against this local MEP but have not been heard from.
Error CCM Reason	The reason that the local MEP is detecting the errorCCMdefect condition (if any):Wrong MEP ID Received - CCM received with correct level and MAID, but MEP ID has not been configured in this MA.My MEP ID Received - CCM received with correct level and MAID, but an MEP ID that is the same as a local MEP in this MA.My MEP ID Received (loop) - as above, but the CCM received also has the same MAC address as the local MEP in the MA.CCM Interval Mismatch - CCM received with correct level and MAID, but CCM interval does not match that configured for this MA.MAC address mismatch - for a configured unicast RMEP (via crosscheck) the MAC address did not match the provisioned value in the associated MA.N/A - indicates there is no error CCM defect being detected.
Last Error CCM	If an errorCCMdefect condition is detected, portions of the CCM that caused this condition are displayed.
Cross Connect Defect Reason	The reason that the local MEP is detecting the xconCCMdefect condition (if any):Wrong MAID - CCM received with correct level but incorrect MAID (mismatch in the domain name and/or short MA name versus configured).Wrong Level - CCM received with a level that is lower than the level configured for this local MEP's domain.N/A - indicates there is no error CCM defect being detected.
Last Cross Connect CCM	If a xconCCMdefect condition is detected, portions of the CCM that caused this condition are displayed.

Related commands [clear mep counter](#)
[ethernet cfm mep](#)
[show ethernet cfm details](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm maintenance-points remote mep

Overview Use this command to show one or more Ethernet CFM maintenance points, namely Remote Maintenance End Points (MEPs) within a given Maintenance Association (MA) and its associated Maintenance Domain (MD), and their configuration and status in summary format. Options include the ability to show an individual Remote MEP in detail.

Syntax show ethernet cfm maintenance-points remote mep domain *<domain-name>* service *<ma-name>* [{mac *<rmep-mac-address>*|rmep *<mep-id>*} details]

Parameter	Description
domain	Specify the Maintenance Domain that Remote MEP(s) are to be shown for.
<i><domain-name></i>	Specify the Maintenance Domain's CLI instance name.
service	Specify the Maintenance Association that the Remote MEP(s) are to be shown for.
<i><ma-name></i>	Specify the service's (Maintenance Association (MA)) CLI instance name.
mac	Specify the remote MEP of interest by its MAC address.
<i><rmep-mac-address></i>	Specify the value of the remote MEP's MAC address using the format HHHH.HHHH.HHHH where H is a hexadecimal digit.
rmep	Specify the remote MEP of interest by its ID.
<i><mep-id></i>	Specify the value of the remote MEP's ID in the range 1 to 8191.

Mode User Exec/Privileged Exec

Example To show all the remote MEP(s)'s status for this MA and MD in summary form, use the command:

```
awplus# show ethernet cfm maintenance-points remote mep domain  
MD-INST1 service MA-INST1-1
```

To show a specific remote MEP by its ID in detail, use the command:

```
awplus# show ethernet cfm maintenance-points remote mep domain  
MD-INST1 service MA-INST1-1 rmep 21 details
```

To show a specific remote MEP by its MAC address in detail, use the command:

```
awplus# show ethernet cfm maintenance-points remote mep domain  
MD-INST1 service MA-INST1-1 mac 000c.2526.95bf details
```

Output The following shows typical output.

Example output from show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1

```
awplus#show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1

CFM Domain Name: MD-INST1
CFM Service Name: MA-INST1-1
      RX      RX      Port  Intf
MEPID  CCM    RDI    Stat  Stat
-----
21      Yes   No     Up    Up
```

Example output from show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1 rmep 21 details

```
awplus#show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1 rmep 21 details

CFM Service Name..... MA-INST1-1
CFM Domain Name..... MD-INST1
Remote MEPID..... 21
Receiving CCMS..... Yes
Rx RDI..... No
MAC Address..... 000c.2526.95bf
Port Status..... Up
Interface Status..... Up
```

Example output from show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1 mac 000c.2526.95bf details

```
awplus#show ethernet cfm maintenance-points remote mep domain MD-INST1 service MA-INST1-1 mac 000c.2526.95bf details

CFM Service Name..... MA-INST1-1
CFM Domain Name..... MD-INST1
Remote MEPID..... 21
Receiving CCMS..... Yes
Rx RDI..... No
MAC Address..... 000c.2526.95bf
Port Status..... Up
Interface Status..... Up
```

Parameters in the output from show ethernet cfm maintenance-points remote mep

Parameter	Description
CFM Domain Name and CFM Service Name	The instance identifiers that uniquely identify the MA and MD for the remote MEP(s) of interest.
Remote MEPID	The remote MEP ID that is configured for this MA.
Receiving CCMS	The current state of the 802.1ag remote MEP state machine:Yes - RMEP_OK. CCMS are being

Parameter	Description
	received without any error.Wait - RMEP_START. Still preparing to receive remote MEP CCMs without a timeout occurring.Failed - RMEP_FAILED. While waiting to receive CCMs from a remote MEP, a timeout occurred.- - the state machine is not running.
RX RDI	The current RDI being received from this remote MEP:True - the last CCM received from the remote MEP has the RDI set. This means the remote MEP itself is seeing one of the following defects: someRMEPCCMDefect, someMACstatusDefect, errorCCMdefect, xconCCMdefect.False - the last CCM received from the remote MEP does not have its RDI set.
MAC Address	The configured or discovered MAC address of the remote MEP.
Port Status	If the CCM was received with a port status TLV, this indicates the last value received, or "-" if none received.
Interface Status	If the CCM was received with an interface status TLV, this indicates the last value received, or "-" if none received.

Related commands

- [ethernet cfm domain-name](#)
- [mep crosscheck](#)
- [service ma-name](#)
- [show ethernet cfm details](#)

Command changes

- Version 5.4.7-1.1: command added
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

show ethernet cfm service

Overview Use this command to show the Ethernet CFM Services (Maintenance Associations (MA)) configuration in summary format, or show a specified MA with detailed information.

Syntax show ethernet cfm service [*<ma-name>* domain *<domain-name>* details]

Parameter	Description
<i><ma-name></i>	The CLI name that identifies the service (Maintenance Association (MA)) instance of interest.
domain	Specify the domain name by name.
<i><domain-name></i>	The CLI name that identifies this Maintenance Domain instance.

Mode User Exec/Privileged Exec

Example To show details for all MAs in summary form, use the command:

```
awplus# show ethernet cfm service
```

To show a specified MA in detailed form, use the command:

```
awplus# show ethernet cfm service MA-INST2-1 domain MD-INST2 details
```

Output The following shows typical output.

Example output from show ethernet cfm service

```
awplus#show ethernet cfm service
```

CFM Domain Name	CFM Service Name	VLAN	Defect
MD-INST1	MA-INST1-1	NONE	.....
MD-INST2	MA-INST2-1	NONE	..3..

Parameters in the output from show ethernet cfm service

Parameter	Description
CFM Domain Name	The Maintenance Domain name for the managed object.
CFM Service Name	The Maintenance Associations (MA) instance name.
VLAN	The Primary VLAN.
Defect	A list of defects detected by the MA's Local MEPs. The defects shown can be:1 - someRDIdefect is declared2 - someMACstatusDefect is declared3 - someRMEPCCMdefect is declared4 - errorCCMdefect is declared5 - xconCCMdefect is declared

Example output from show ethernet cfm service MA-INST2-1 domain MD-INST2 details

```
awplus#show ethernet cfm service MA-INST2-1 domain MD-INST2 details
```

CFM Service Name.....	MA-INST2-1
CFM Domain Name.....	MD-INST2
CFM Domain Level.....	3
Primary VLAN.....	-
Maintenance Assoc Name Format...	string
Maintenance Assoc Name Value....	MA-12V100
CCM Transmission Interval.....	1 second
Local MEPs.....	MEP DOWN
	12 (interface port1.0.2)
Configured Remote MEPs.....	21
Missing Remote MEPs.....	21
Current MEP Defects.....	3 (someRMEPCCMdefect)
MIP Creation.....	None

Parameters in the output from show ethernet cfm service <ma-name> domain <domain-name> details

Parameter	Description
CFM Service Name	The Maintenance Associations (MA) instance name.

Parameter	Description
CFM Domain Name	The Maintenance Domain name for the managed object.
CFM Domain Level	The level of the domain.
Primary VLAN	The Primary VLAN that was configured (if any).
Maintenance Assoc Name Format and Value	The name and name format of the MA. The name format is one of the following: ICC - ICC string based name format Integer - Integer based name format Primary-vid - Primary VLAN based name format String - Character string based name format VPN-ID - VPN-ID based name format
CCM Transmission Interval	The CCI that was configured for this MA. It can be one of the following: 3 - CCI of 100 milliseconds 4 - CCI of 1 second (default) 5 - CCI of 10 seconds 6 - CCI of 1 minute 7 - CCI of 10 minutes
Local MEPs	A list of the Local MEPs configured for this MA. For each MEP, it displays the MEP direction Up or Down, its MEP-id, and the interface it was configured on.
Configured Remote MEPs	A list of Remote MEPs by MEP-id.
Missing Remote MEPs	A list of the configured Remote MEPs that this MA has not received any CCM messages from within 3.5 times the configured CCI.
Defect	A list of defects detected by the MA's Local MEPs. The defects shown can be: 1 - someRDIdefect is declared 2 - someMACstatusDefect is declared 3 - someRMEPCCMdefect is declared 4 - errorCCMdefect is declared 5 - xconCCMdefect is declared

Related commands

- [ethernet cfm domain-name](#)
- [ethernet cfm mep](#)
- [mep crosscheck](#)
- [service ma-name](#)
- [show ethernet cfm details](#)

Command changes

- Version 5.4.7-1.1: command added
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

show mep-alarm status

Overview Use this command to show any alarms that have been declared by Local MEPs, and the defect(s) that caused the alarm.

Syntax show mep-alarm status

Mode User Exec/Privileged Exec

Usage notes A Local MEP is used to detect connectivity faults with other remote MEPs that are in the same Maintenance Association (MA) and Maintenance Domain (MD) as the Local MEP. A Local MEP looks first for connectivity defects, and if these defects persist for a long enough period of time (typically 2.5 seconds), then an alarm is declared.

Example To show the alarms on local MEPs, use the command:
awplus# show mep-alarm status

Output The following shows typical output.

Example output from show mep-alarm status

awplus#show mep-alarm status			
CFM Domain Name	CFM Service Name	MEP	Active Alarm

MD-INST1	MA-INST1-1	12	someRMEPCCM

Parameters in the output from show mep-alarm status

Parameter	Description
CFM Domain Name	The domain name.
CFM Service Name	The MA name.
Active Alarms	The highest priority defect causing the alarm, one of the following: someRDI, someMACstatus, someRMEPCCM, errorCCM, or xconCCM.
MEP	The local MEP's ID.

Related commands [ethernet cfm mep](#)
[mep \(FNG attributes\)](#)
[mep crosscheck](#)

Command changes Version 5.4.7-1.1: command added
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

9

Logging Commands

- Contents**
- **Introduction** on page 375
 - **clear exception log** on page 376
 - **clear log** on page 377
 - **clear log buffered** on page 378
 - **clear log external** on page 379
 - **clear log permanent** on page 380
 - **copy buffered-log** on page 381
 - **copy permanent-log** on page 382
 - **default log buffered** on page 383
 - **default log console** on page 384
 - **default log email** on page 385
 - **default log external** on page 386
 - **default log host** on page 387
 - **default log monitor** on page 388
 - **default log permanent** on page 389
 - **log buffered** on page 390
 - **log buffered (filter)** on page 391
 - **log buffered exclude** on page 396
 - **log buffered size** on page 400
 - **log console** on page 401
 - **log console (filter)** on page 402
 - **log console exclude** on page 407
 - **log email** on page 411
 - **log email (filter)** on page 412
 - **log email exclude** on page 417
 - **log email time** on page 421
 - **log external** on page 423
 - **log external (filter)** on page 425
 - **log external exclude** on page 430
 - **log external rotate** on page 435
 - **log external size** on page 437
 - **log facility** on page 438
 - **log host** on page 440
 - **log host (filter)** on page 442
 - **log host exclude** on page 447
 - **log host source** on page 452
 - **log host startup-delay** on page 453

- **log host time** on page 455
- **log monitor (filter)** on page 457
- **log monitor exclude** on page 462
- **log permanent** on page 466
- **log permanent (filter)** on page 467
- **log permanent exclude** on page 472
- **log permanent size** on page 476
- **log-rate-limit nsm** on page 477
- **log trustpoint** on page 479
- **show counter log** on page 481
- **show exception log** on page 483
- **show log** on page 484
- **show log config** on page 486
- **show log external** on page 489
- **show log permanent** on page 490
- **show running-config log** on page 492
- **unmount** on page 493

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure logging. See the [Logging Feature Overview and Configuration Guide](#) for more information about the different types of log and how to filter log messages.

clear exception log

Overview This command resets the contents of the exception log, but does not remove the associated core files.

Syntax clear exception log

Mode Privileged Exec

Example awplus# clear exception log

clear log

Overview This command removes the contents of the buffered and permanent logs.

Syntax clear log

Mode Privileged Exec

Example To delete the contents of the buffered and permanent log use the command:

```
awplus# clear log
```

Related commands

- [clear log buffered](#)
- [clear log permanent](#)
- [show log](#)

clear log buffered

Overview This command removes the contents of the buffered log.

Syntax clear log buffered

Mode Privileged Exec

Example To delete the contents of the buffered log use the following commands:

```
awplus# clear log buffered
```

Related commands

- [default log buffered](#)
- [log buffered](#)
- [log buffered \(filter\)](#)
- [log buffered size](#)
- [log buffered exclude](#)
- [show log](#)
- [show log config](#)

clear log external

Overview Use this command to delete the external log file from the USB storage device it is stored on.

If the external log is rotating between multiple files, this command deletes all those files, not just the most recent one.

Syntax `clear log external`

Mode Privileged Exec

Example To delete the external log file, use the command:

```
awplus# clear log external
```

Related commands

- [default log external](#)
- [log external](#)
- [log external \(filter\)](#)
- [log external exclude](#)
- [log external rotate](#)
- [log external size](#)
- [show log config](#)
- [show log external](#)
- [unmount](#)

Command changes Version 5.4.7-1.1: command added

clear log permanent

Overview This command removes the contents of the permanent log.

Syntax clear log permanent

Mode Privileged Exec

Example To delete the contents of the permanent log use the following commands:

```
awplus# clear log permanent
```

Related commands

- [default log permanent](#)
- [log permanent](#)
- [log permanent \(filter\)](#)
- [log permanent exclude](#)
- [log permanent size](#)
- [show log config](#)
- [show log permanent](#)

copy buffered-log

Overview Use this command to copy the buffered log to an internal or external destination.

Syntax `copy buffered-log <destination-name>`

Parameter	Description
<code><destination-name></code>	The filename and path for the destination file. See Introduction for valid syntax.

Mode Privileged Exec

Example To copy the buffered log file into a folder in Flash named “buffered-log” and name the file “buffered-log.log”, use the command:

```
awplus# copy buffered-log flash:/buffered-log/buffered-log.log
```

To copy the buffered log file onto a USB storage device and name the file “buffered-log.log”, use the command:

```
awplus# copy buffered-log usb:/buffered-log.log
```

Related commands [log buffered](#)
[show file systems](#)
[show log](#)

Command changes Version 5.4.7-1.1: command added

copy permanent-log

Overview Use this command to copy the permanent log to an internal or external destination.

Syntax copy permanent-log <destination-name>

Parameter	Description
<destination-name>	The filename and path for the destination file. See Introduction for valid syntax.

Mode Privileged Exec

Example To copy the permanent log file into a folder in Flash named “perm-log” and name the file “permanent-log.log”, use the command:

```
awplus# copy permanent-log flash:/perm-log/permanent-log.log
```

To copy the permanent log file onto a USB storage device and name the file “permanent-log.log”, use the command:

```
awplus# copy permanent-log usb:/permanent-log.log
```

Related commands [log permanent](#)
[show file systems](#)
[show log permanent](#)

Command changes Version 5.4.7-1.1: command added

default log buffered

Overview This command restores the default settings for the buffered log stored in RAM. By default the size of the buffered log is 50 kB and it accepts messages with the severity level of “warnings” and above.

Syntax default log buffered

Default The buffered log is enabled by default.

Mode Global Configuration

Example To restore the buffered log to its default settings use the following commands:

```
awplus# configure terminal
awplus(config)# default log buffered
```

Related commands

- clear log buffered**
- log buffered**
- log buffered (filter)**
- log buffered size**
- log buffered exclude**
- show log**
- show log config**

default log console

Overview This command restores the default settings for log messages sent to the terminal when a **log console** command is issued. By default all messages are sent to the console when a **log console** command is issued.

Syntax default log console

Mode Global Configuration

Example To restore the log console to its default settings use the following commands:

```
awplus# configure terminal
awplus(config)# default log console
```

Related commands

- log console**
- log console (filter)**
- log console exclude**
- show log config**

default log email

Overview This command restores the default settings for log messages sent to an email address. By default no filters are defined for email addresses. Filters must be defined before messages will be sent. This command also restores the remote syslog server time offset value to local (no offset).

Syntax `default log email <email-address>`

Parameter	Description
<code><email-address></code>	The email address to send log messages to

Mode Global Configuration

Example To restore the default settings for log messages sent to the email address `admin@alliedtelesis.com` use the following commands:

```
awplus# configure terminal
awplus(config)# default log email admin@alliedtelesis.com
```

Related commands

- [log email](#)
- [log email \(filter\)](#)
- [log email exclude](#)
- [log email time](#)
- [show log config](#)

default log external

Overview Use this command to restore the default settings for the external log. By default, the size of the external log is 50 kB, it rotates through 1 additional file, and it accepts messages with a severity level of notices and above.

Note that this command does not clear the configured filename for the external log.

Syntax `default log external`

Mode Global Configuration

Example To restore the default settings for the external log, use the commands:

```
awplus# configure terminal
awplus(config)# default log external
```

Related commands

- `clear log external`
- `log external`
- `log external (filter)`
- `log external exclude`
- `log external rotate`
- `log external size`
- `show log config`
- `show log external`
- `unmount`

Command changes Version 5.4.7-1.1: command added

default log host

Overview This command restores the default settings for log sent to a remote syslog server. By default no filters are defined for remote syslog servers. Filters must be defined before messages will be sent. This command also restores the remote syslog server time offset value to local (no offset).

Syntax default log host *<ip-addr>*

Parameter	Description
<i><ip-addr></i>	The IP address of a remote syslog server

Mode Global Configuration

Example To restore the default settings for messages sent to the remote syslog server with IP address 10.32.16.21 use the following commands:

```
awplus# configure terminal
awplus(config)# default log host 10.32.16.21
```

Related commands

- [log host](#)
- [log host \(filter\)](#)
- [log host exclude](#)
- [log host source](#)
- [log host time](#)
- [show log config](#)

default log monitor

Overview This command restores the default settings for log messages sent to the terminal when a **terminal monitor** command is used.

Syntax default log monitor

Default All messages are sent to the terminal when a **terminal monitor** command is used.

Mode Global Configuration

Example To restore the log monitor to its default settings use the following commands:

```
awplus# configure terminal
awplus(config)# default log monitor
```

Related commands

- log monitor (filter)**
- log monitor exclude**
- show log config**
- terminal monitor**

default log permanent

Overview This command restores the default settings for the permanent log stored in NVS. By default, the size of the permanent log is 50 kB and it accepts messages with the severity level of warnings and above.

Syntax default log permanent

Default The permanent log is enabled by default.

Mode Global Configuration

Example To restore the permanent log to its default settings use the following commands:

```
awplus# configure terminal
awplus(config)# default log permanent
```

Related commands

- clear log permanent**
- log permanent**
- log permanent (filter)**
- log permanent exclude**
- log permanent size**
- show log config**
- show log permanent**

log buffered

Overview This command configures the device to store log messages in RAM. Messages stored in RAM are not retained on the device over a restart. Once the buffered log reaches its configured maximum allowable size old messages will be deleted to make way for new ones.

Syntax log buffered
no log buffered

Default The buffered log is configured by default.

Mode Global Configuration

Examples To configured the device to store log messages in RAM use the following commands:

```
awplus# configure terminal  
awplus(config)# log buffered
```

To configure the device to not store log messages in a RAM buffer use the following commands:

```
awplus# configure terminal  
awplus(config)# no log buffered
```

Related commands

- clear log buffered**
- copy buffered-log**
- default log buffered**
- log buffered (filter)**
- log buffered size**
- log buffered exclude**
- show log**
- show log config**

log buffered (filter)

Overview Use this command to create a filter to select messages to be sent to the buffered log. Selection can be based on the priority/ severity of the message, the program that generated the message, the logging facility used, a sub-string within the message or a combination of some or all of these.

The **no** variant of this command removes the corresponding filter, so that the specified messages are no longer sent to the buffered log.

Syntax log buffered [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log buffered [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Filter messages to the buffered log by severity level.																
<level>	The minimum severity of message to send to the buffered log. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
0 emergencies	System is unusable																
1 alerts	Action must be taken immediately																
2 critical	Critical conditions																
3 errors	Error conditions																
4 warnings	Warning conditions																
5 notices	Normal, but significant, conditions																
6 informational	Informational messages																
7 debugging	Debug-level messages																
program	Filter messages to the buffered log by program. Include messages from a specified program in the buffered log.																
<program- name>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)						
rip	Routing Information Protocol (RIP)																
ripng	Routing Information Protocol - next generation (RIPng)																
ospf	Open Shortest Path First (OSPF)																
ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)																
bgp	Border Gateway Protocol (BGP)																

Parameter	Description
rsvp	Resource Reservation Protocol (RSVP)
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages to the buffered log by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from in the buffered log:
kern	Kernel messages

Parameter	Description
user	Random user-level messages
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default By default the buffered log has a filter to select messages whose severity level is “notices (5)” or higher. This filter may be removed using the **no** variant of this command.

Mode Global Configuration

Examples To add a filter to send all messages generated by EPSR that have a severity of **notices** or higher to the buffered log, use the following commands:

```
awplus# configure terminal
awplus(config)# log buffered level notices program epsr
```

To add a filter to send all messages containing the text “Bridging initialization” to the buffered log, use the following commands:

```
awplus# configure terminal
awplus(config)# log buffered msgtext Bridging initialization
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to the buffered log, use the following commands:

```
awplus# configure terminal
awplus(config)# no log buffered level notices program epsr
```

To remove a filter that sends all messages containing the text “Bridging initialization” to the buffered log, use the following commands:

```
awplus# configure terminal
awplus(config)# no log buffered msgtext Bridging initialization
```

Related commands

- clear log buffered**
- default log buffered**
- log buffered**
- log buffered size**
- log buffered exclude**
- show log**
- show log config**

log buffered exclude

Overview Use this command to exclude specified log messages from the buffered log. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax log buffered exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log buffered exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description
level	Exclude messages of the specified severity level.
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity:
0|emergencies	System is unusable
1|alerts	Action must be taken immediately
2|critical	Critical conditions
3|errors	Error conditions
4|warnings	Warning conditions
5|notices	Normal, but significant, conditions
6|informational	Informational messages
7|debugging	Debug-level messages
program	Exclude messages from a specified program.
<program- name>	The name of a program. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The predefined names are not case sensitive but other program names from the log output are.
rip	Routing Information Protocol (RIP)
ripng	Routing Information Protocol - next generation (RIPng)
ospf	Open Shortest Path First (OSPF)
ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)
bgp	Border Gateway Protocol (BGP)
rsvp	Resource Reservation Protocol (RSVP)

Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log buffered exclude msgtext example of
irrelevant message
```

Related commands

- [clear log buffered](#)
- [default log buffered](#)
- [log buffered](#)
- [log buffered \(filter\)](#)
- [log buffered size](#)
- [show log](#)
- [show log config](#)

log buffered size

Overview This command configures the amount of memory that the buffered log is permitted to use. Once this memory allocation has been filled, old messages will be deleted to make room for new messages.

Use the **no** variant of this command to return to the default.

Syntax log buffered size <50-250>

Parameter	Description
<50-250>	Size of the permanent log in kilobytes

Default 50 kilobytes

Mode Global Configuration

Example To allow the buffered log to use up to 100 kilobytes of RAM, use the commands:

```
awplus# configure terminal
awplus(config)# log buffered size 100
```

To return to the default value, use the commands:

```
awplus# configure terminal
awplus(config)# no log buffered size
```

Related commands

- clear log buffered**
- copy buffered-log**
- default log buffered**
- log buffered**
- log buffered (filter)**
- log buffered exclude**
- show log**
- show log config**

Command changes Version 5.5.3-2.1: Maximum and default size increased on AMFCloud and AR4000S-Cloud

log console

Overview This command configures the device to send log messages to consoles. The console log is configured by default to send messages to the device's main console port.

Use the **no** variant of this command to configure the device not to send log messages to consoles.

Syntax log console
no log console

Mode Global Configuration

Examples To configure the device to send log messages use the following commands:

```
awplus# configure terminal  
awplus(config)# log console
```

To configure the device not to send log messages in all consoles use the following commands:

```
awplus# configure terminal  
awplus(config)# no log console
```

Related commands [default log console](#)
[log console \(filter\)](#)
[log console exclude](#)
[show log config](#)

log console (filter)

Overview This command creates a filter to select messages to be sent to all consoles when the **log console** command is given. Selection can be based on the priority/severity of the message, the program that generated the message, the logging facility used, a sub-string within the message or a combination of some or all of these.

Syntax log console [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log console [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Filter messages by severity level.																
<level>	The minimum severity of message to send. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default By default the console log has a filter to select messages whose severity level is **critical** or higher. This filter may be removed using the **no** variant of this command. This filter may be removed and replaced by filters that are more selective.

Mode Global Configuration

Examples To create a filter to send all messages containing the text “Bridging initialization” to console instances where the **log console** command has been entered, use the following commands:

```
awplus# configure terminal
awplus(config)# log console msgtext "Bridging initialization"
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to consoles, use the following commands:

```
awplus# configure terminal
awplus(config)# no log console level notices program epsr
```

To remove a default filter that includes sending **critical**, **alert** and **emergency** level messages to the console, use the following commands:

```
awplus# configure terminal
awplus(config)# no log console level critical
```

Related commands

- default log console**
- log console**
- log console exclude**
- show log config**

log console exclude

Overview Use this command to prevent specified log messages from being sent to the console, when console logging is turned on. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax log console exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log console exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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program	Exclude messages from a specified program.																
<program- name>	The name of a program. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The predefined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> <tr> <td>rsvp</td><td>Resource Reservation Protocol (RSVP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)	rsvp	Resource Reservation Protocol (RSVP)				
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
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poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log console exclude msgtext example of
irrelevant message
```

Related commands

- [default log console](#)
- [log console](#)
- [log console \(filter\)](#)
- [show log config](#)

log email

Overview This command configures the device to send log messages to an email address. The email address is specified in this command.

Syntax `log email <email-address>`

Parameter	Description
<code><email-address></code>	The email address to send log messages to

Default By default no filters are defined for email log targets. Filters must be defined before messages will be sent.

Mode Global Configuration

Example To have log messages emailed to the email address `admin@alliedtelesis.com` use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@alliedtelesis.com
```

Related commands

- [default log email](#)
- [log email \(filter\)](#)
- [log email exclude](#)
- [log email time](#)
- [show log config](#)

log email (filter)

Overview This command creates a filter to select messages to be sent to an email address. Selection can be based on the priority/ severity of the message, the program that generated the message, the logging facility used, a substring within the message or a combination of some or all of these.

The **no** variant of this command configures the device to no longer send log messages to a specified email address. All configuration relating to this log target will be removed.

Syntax log email <email-address> [level <level>] [program <program-name>] [facility <facility>] [msgtext <text-string>]
no log email <email-address> [level <level>] [program <program-name>] [facility <facility>] [msgtext <text-string>]

Parameter	Description																
<email- address>	The email address to send logging messages to																
level	Filter messages by severity level.																
<level>	The minimum severity of message to send. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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<program- name>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)						
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Parameter	Description
rsvp	Resource Reservation Protocol (RSVP)
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
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rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from:
kern	Kernel messages

Parameter	Description
user	Random user-level messages
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Mode Global Configuration

Examples To create a filter to send all messages generated by EPSR that have a severity of **notices** or higher to the email address admin@homebase.com, use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@homebase.com level notices
program epsr
```

To create a filter to send all messages containing the text "Bridging initialization", to the email address admin@homebase.com, use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@homebase.com msgtext "Bridging
initialization"
```

To create a filter to send messages with a severity level of **informational** and above to the email address admin@alliedtelesis.com, use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@alliedtelesis.com level
informational
```

To stop the device emailing log messages emailed to the email address admin@alliedtelesis.com, use the following commands:

```
awplus# configure terminal
awplus(config)# no log email admin@homebase.com
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to the email address admin@homebase.com, use the following commands:

```
awplus# configure terminal
awplus(config)# no log email admin@homebase.com level notices
program epsr
```

To remove a filter that sends messages with a severity level of **informational** and above to the email address admin@alliedtelesis.com, use the following commands:

```
awplus# configure terminal
awplus(config)# no log email admin@alliedtelesis.com level
informational
```

Related commands

- [default log email](#)
- [log email](#)
- [log email exclude](#)
- [log email time](#)
- [show log config](#)

log email exclude

Overview Use this command to prevent specified log messages from being emailed, when the device is configured to send log messages to an email address. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax log email exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log email exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
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dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
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cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log email exclude msgtext example of irrelevant message
```

Related commands

- [default log email](#)
- [log email](#)
- [log email \(filter\)](#)
- [log email time](#)
- [show log config](#)

log email time

Overview This command configures the time used in messages sent to an email address. If the syslog server is in a different time zone to your device then the time offset can be configured using either the **utc-offset** parameter option keyword or the **local-offset** parameter option keyword, where **utc-offset** is the time difference from UTC (Universal Time, Coordinated) and **local-offset** is the difference from local time.

Syntax `log email <email-address> time {local|local-offset|utc-offset {plus|minus}<0-24>}`

Parameter	Description
<email-address>	The email address to send log messages to
time	Specify the time difference between the email recipient and the device you are configuring.
local	The device is in the same time zone as the email recipient
local-offset	The device is in a different time zone to the email recipient. Use the plus or minus keywords and specify the difference (offset) from local time of the device to the email recipient in hours.
utc-offset	The device is in a different time zone to the email recipient. Use the plus or minus keywords and specify the difference (offset) from UTC time of the device to the email recipient in hours.
plus	Negative offset (difference) from the device to the email recipient.
minus	Positive offset (difference) from the device to the email recipient.
<0-24>	World Time zone offset in hours

Default The default is **local** time.

Mode Global Configuration

Usage notes Use the **local** option if the email recipient is in the same time zone as this device. Messages will display the time as on the local device when the message was generated.

Use the **offset** option if the email recipient is in a different time zone to this device. Specify the time offset of the email recipient in hours. Messages will display the time they were generated on this device but converted to the time zone of the email recipient.

Examples To send messages to the email address `test@home.com` in the same time zone as the device's local time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@base.com time local 0
```

To send messages to the email address `admin@base.com` with the time information converted to the time zone of the email recipient, which is 3 hours ahead of the device's local time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log email admin@base.com time local-offset plus
3
```

To send messages to the email address `user@remote.com` with the time information converted to the time zone of the email recipient, which is 3 hours behind the device's UTC time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log email user@remote.com time utc-offset minus
3
```

Related commands

- default log email**
- log email**
- log email (filter)**
- log email exclude**
- show log config**

log external

Overview Use this command to enable external logging. External logging sends syslog messages to a file on a USB storage device.

If the file does not already exist on the storage device, it (and any specified subdirectory) will be automatically created. If the file already exists, messages are appended to it.

Use the **no** variant of this command to disable external logging.

Syntax log external <filename>
no log external

Parameter	Description
<filename>	The file and optionally directory path to store the log messages in. See Introduction for valid syntax.

Default External logging is disabled by default.

Mode Global Configuration

Usage notes We strongly recommend using ext3 or ext4 as the file system on the external storage device. These file systems have a lower risk of file corruption occurring if the switch or firewall loses power.

You should also unmount the storage device before removing it from the switch or firewall, to avoid corrupting the log file. To unmount the device, use the **unmount** command.

Example To save messages to a file called “messages.log” in a directory called “log” on a USB storage device, use the command:

```
awplus# configure terminal
awplus(config)# log external usb:/log/messages.log
```

Related commands

- clear log external**
- default log external**
- log external (filter)**
- log external exclude**
- log external rotate**
- log external size**
- show log config**
- show log external**
- unmount**

Command changes Version 5.4.7-1.1: command added

log external (filter)

Overview Use this command to create a filter to select messages to be sent to the external log. You can include messages based on:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

The **no** variant of this command removes the corresponding filter, so that the specified messages are no longer sent to the external log.

Syntax log external [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log external [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Filter messages to the external log by severity level.																
<level>	The minimum severity of message to send to the external log. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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program	Filter messages to the external log by program. Include messages from a specified program in the external log.																
<program- name>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)						
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Parameter	Description
rsvp	Resource Reservation Protocol (RSVP)
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages to the external log by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from in the log:
kern	Kernel messages

Parameter	Description
user	Random user-level messages
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default By default the external log has a filter to select messages whose severity level is “notices (5)” or higher. This filter may be removed using the **no** variant of this command.

Mode Global Configuration

Examples To add a filter to send all messages generated by EPSR that have a severity of **notices** or higher to the external log, use the following commands:

```
awplus# configure terminal
awplus(config)# log external level notices program epsr
```

To add a filter to send all messages containing the text “Bridging initialization” to the external log, use the following commands:

```
awplus# configure terminal
awplus(config)# log external msgtext Bridging initialization
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to the external log, use the following commands:

```
awplus# configure terminal
awplus(config)# no log external level notices program epsr
```

To remove a filter that sends all messages containing the text “Bridging initialization” to the external log, use the following commands:

```
awplus# configure terminal
awplus(config)# no log external msgtext Bridging initialization
```

Related commands

- clear log external**
- default log external**
- log external**
- log external exclude**
- log external rotate**
- log external size**
- show log config**
- show log external**
- unmount**

Command changes Version 5.4.7-1.1: command added

log external exclude

Overview Use this command to exclude specified log messages from the external log. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax log external exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log external exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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program	Exclude messages from a specified program.																
<program- name>	The name of a program. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The predefined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> <tr> <td>rsvp</td><td>Resource Reservation Protocol (RSVP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)	rsvp	Resource Reservation Protocol (RSVP)				
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
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irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global Configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log external exclude msgtext example of
irrelevant message
```

Related commands

- [clear log external](#)
- [default log external](#)
- [log external](#)
- [log external \(filter\)](#)
- [log external rotate](#)
- [log external size](#)
- [show log config](#)
- [show log external](#)
- [unmount](#)

Command changes Version 5.4.7-1.1: command added

log external rotate

Overview Use this command to configure the number of files that the external log can rotate through.

Use the **no** variant of this command to return to the default.

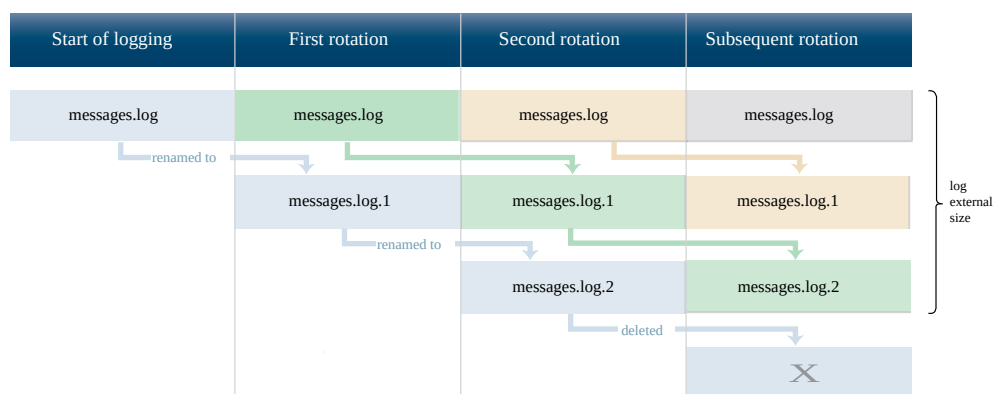
Syntax log external rotate <0-255>
no log external rotate

Parameter	Description
<0-255>	The number of additional files to rotate through. Note that the device rotates between the initial file and the number of additional files specified by this value - see the Usage section below.

Default The default is 1, which rotates between the initial file and 1 additional file (for example, rotates between messages.log and messages.log.1)

Mode Global Configuration

Usage notes The device rotates between the initial file and the number of additional files specified by this command. For example, the diagram below shows how setting rotate to 2 makes the device rotate through 3 files.



Note that if you set rotate to 0, and the external log file becomes full, then the device deletes the full log file and creates a new (empty) file of the same name to save messages into. For this reason, we recommend setting rotate to at least 1.

Example To set the rotation value to 2, and therefore rotate between 3 files, use the commands:

```
awplus# configure terminal
awplus(config)# log external rotate 2
```

Related commands

- [clear log external](#)
- [default log external](#)
- [log external](#)
- [log external \(filter\)](#)
- [log external exclude](#)
- [log external size](#)
- [show log config](#)
- [show log external](#)
- [unmount](#)

Command changes Version 5.4.7-1.1: command added

log external size

Overview Use this command to configure the total amount of size that the external log is permitted to use, in kilobytes. The maximum possible depends on the storage device's file system.

Note that if you are rotating between multiple files, this is the maximum size of all files, not of each individual file. For example, if you are rotating between 2 files (**log external rotate 1**), each file will have a maximum size of 25 kBytes by default.

Use the **no** variant of this command to return to the default size.

Syntax log external size [<50-4194304>]
no log external size

Parameter	Description
<50-4194304>	The total amount of size that the external log is permitted to use, in kilobytes.

Default 50 kBytes

Mode Global Configuration

Example To configure a total log size of 100 kBytes, use the commands:

```
awplus# configure terminal
awplus(config)# log external size 100
```

Related commands

- clear log external**
- default log external**
- log external**
- log external (filter)**
- log external exclude**
- log external rotate**
- log external size**
- show log config**
- show log external**
- unmount**

Command changes Version 5.4.7-1.1: command added

log facility

Overview Use this command to assign a facility to all log messages generated on this device. This facility overrides any facility that is automatically generated as part of the log message.

Use the **no** variant of this command to remove the configured facility.

Syntax `log facility {kern|user|mail|daemon|auth|syslog|lpr|news|uucp|cron|authpriv|ftp|local0|local1|local2|local3|local4|local5|local6|local7}`
`no log facility`

Default None. The outgoing syslog facility depends on the log message.

Mode Global Configuration

Usage notes Specifying different facilities for log messages generated on different devices can allow messages from multiple devices sent to a common server to be distinguished from each other.

Ordinarily, the facility values generated in log messages have meanings as shown in the following table. Using this command will override these meanings, and the new meanings will depend on the use you put them to.

Ordinary meanings of the facility parameter in log messages

Facility	Description
kern	Kernel messages
user	User-level messages
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by the syslog daemon
lpr	Line printer subsystem
news	Network news subsystem
uucp	UNIX-to-UNIX Copy Program subsystem
cron	Clock daemon
authpriv	Security/authorization (private) messages
ftp	FTP daemon
local<0..7>	The facility labels above have specific meanings, while the local facility labels are intended to be put to local use. In AlliedWare Plus, some of these local facility labels are used in log messages. In particular, local5 is assigned to log messages generated by UTM Firewall security features.

Example To specify a facility of local6, use the following commands:

```
awplus# configure terminal
awplus(config)# log facility local6
```

Related commands [show log config](#)

log host

Overview This command configures the device to send log messages to a remote syslog server via UDP port 514. The IP address of the remote server must be specified. By default no filters are defined for remote syslog servers. Filters must be defined before messages will be sent.

Use the **no** variant of this command to stop sending log messages to the remote syslog server.

Syntax `log host <ipv4-addr> [secure]`
`log host <ipv6-addr>`
`no log host <ipv4-addr>|<ipv6-addr>`

Parameter	Description
<ipv4-addr>	Specify the source IPv4 address, in dotted decimal notation (A.B.C.D).
<ipv6-addr>	Specify the source IPv6 address, in X:X::X:X notation.
secure	Optional value to create a secure log destination. This option is only valid for IPv4 hosts.

Mode Global Configuration

Usage notes Use the optional **secure** parameter to configure a secure IPv4 syslog host. For secure hosts, syslog over TLS is used to encrypt the logs. The certificate received from the remote log server must have an issuer chain that terminates with the root CA certificate for any of the trustpoints that are associated with the application.

The remote server may also request that a certificate is transmitted from the local device. In this situation the first trustpoint added to the syslog application will be transmitted to the remote server.

For detailed information about securing syslog, see the [PKI Feature Overview_and Configuration_Guide](#).

Examples To configure the device to send log messages to a remote secure syslog server with IP address 10.32.16.99, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.99 secure
```

To stop the device from sending log messages to the remote syslog server with IP address 10.32.16.99, use the following commands:

```
awplus# configure terminal
awplus(config)# no log host 10.32.16.99
```

Related commands

- default log host**
- log host (filter)**
- log host exclude**
- log host source**
- log host startup-delay**
- log host time**
- log trustpoint**
- show log config**

Command changes Version 5.5.2-1.1: **vrf** parameter added for products that support VRF

log host (filter)

Overview This command creates a filter to select messages to be sent to a remote syslog server. Selection can be based on the priority/severity of the message, the program that generated the message, the logging facility used, a substring within the message or a combination of some or all of these.

The **no** variant of this command configures the device to no longer send log messages to a remote syslog server. The IP address of the syslog server must be specified. All configuration relating to this log target will be removed.

Syntax `log host <ip-addr> [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log host <ip-addr> [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]`

Parameter	Description																
<code><ip-addr></code>	The IP address of a remote syslog server.																
<code>level</code>	Filter messages by severity level.																
<code><level></code>	The minimum severity of message to send. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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<code>program</code>	Filter messages by program. Include messages from a specified program.																
<code><program- name></code>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> <tr> <td>rsvp</td><td>Resource Reservation Protocol (RSVP)</td></tr> <tr> <td>pim-dm</td><td>Protocol Independent Multicast - Dense Mode (PIM-DM)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)	rsvp	Resource Reservation Protocol (RSVP)	pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)		
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Parameter	Description
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
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epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from:
kern	Kernel messages
user	Random user-level messages
mail	Mail system
daemon	System daemons

Parameter	Description
	auth Security/authorization messages
	syslog Messages generated internally by syslogd
	lpr Line printer subsystem
	news Network news subsystem
	uucp UUCP subsystem
	cron Clock daemon
	authpriv Security/authorization messages (private)
	ftp FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Mode Global Configuration

Examples To create a filter to send all messages generated by EPSR that have a severity of **notices** or higher to a remote syslog server with IP address 10.32.16.21, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.21 level notices program epsr
```

To create a filter to send all messages containing the text "Bridging initialization", to a remote syslog server with IP address 10.32.16.21, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.21 msgtext "Bridging
initialization"
```

To create a filter to send messages with a severity level of **informational** and above to the syslog server with IP address 10.32.16.21, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.21 level informational
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to a remote syslog server with IP address 10.32.16.21, use the following commands:

```
awplus# configure terminal
awplus(config)# no log host 10.32.16.21 level notices program
epsr
```

To remove a filter that sends all messages containing the text "Bridging initialization", to a remote syslog server with IP address 10.32.16.21, use the following commands:

```
awplus# configure terminal
awplus(config)# no log host 10.32.16.21 msgtext "Bridging
initialization"
```

To remove a filter that sends messages with a severity level of **informational** and above to the syslog server with IP address 10.32.16.21, use the following commands:

```
awplusawpluls# configure terminal
awplus(config)# no log host 10.32.16.21 level informational
```

Related commands [default log host](#)
[log host](#)

[log host exclude](#)

[log host source](#)

[log host time](#)

[show log config](#)

Command changes Version 5.5.2-1.1: **vrf** parameter added for products that support VRF

log host exclude

Overview Use this command to prevent specified log messages from being sent to the remote syslog server, when **log host** is enabled. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax `log host {<hostname>|<ipv4-addr>|<ipv6-addr>} exclude
[level <level>] [program <program-name>] [facility <facility>]
[msgtext <text-string>]
no log host {<hostname>|<ipv4-addr>|<ipv6-addr>} exclude
[level <level>] [program <program-name>] [facility <facility>]
[msgtext <text-string>]`

Parameter	Description																
<hostname>	The host name of a remote syslog server.																
<ipv4-addr>	The IPv4 address of a remote syslog server, in A.B.C.D format.																
<ipv6-addr>	The IPv6 address of a remote syslog server, in X:X::X:X format.																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHPCPSN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To exclude messages that contain the string 'example of irrelevant message' being sent to the remote syslog server 10.10.10.100, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.10.10.100 exclude msgtext example of
irrelevant message
```

Related commands

- [default log host](#)
- [log host](#)
- [log host \(filter\)](#)
- [log host source](#)
- [log host time](#)
- [show log config](#)

Command changes Version 5.2.2-1.1: **vrf** parameter added for products that support VRF

log host source

Overview Use this command to specify a source interface or IP address for the device to send syslog messages from. You can specify any one of an interface name, an IPv4 address or an IPv6 address.

This is useful if the device can reach the syslog server via multiple interfaces or addresses and you want to control which interface/address the device uses.

Note that AlliedWare Plus does not support source interface settings on secure log hosts (which are hosts configured using "log host <ip-address> secure").

Use the **no** variant of this command to stop specifying a source interface or address.

Syntax log host source {<interface-name>|<ipv4-addr>|<ipv6-addr>}
no log host source

Parameter	Description
<interface-name>	Specify the source interface name. You can enter a VLAN, eth interface or loopback interface.
<ipv4-addr>	Specify the source IPv4 address, in dotted decimal notation (A.B.C.D).
<ipv6-addr>	Specify the source IPv6 address, in X:X::X:X notation.

Default None (no source is configured)

Mode Global Configuration

Example To send syslog messages from 192.168.1.1, use the commands:

```
awplus# configure terminal
awplus(config)# log host source 192.168.1.1
```

Related commands

- [default log host](#)
- [log host](#)
- [log host \(filter\)](#)
- [log host exclude](#)
- [log host time](#)
- [show log config](#)

log host startup-delay

Overview Use this command to set the delay between the device booting up and it attempting to connect to remote log hosts. This is to allow time for network connectivity to the remote host to be established. During this period, the device buffers log messages and sends them once it has connected to the remote host.

The startup delay begins when the message "syslog-ng starting up" appears in the log.

If the default startup delay is not long enough for the boot and configuration process to complete and the links to come up, you may see logging failure messages on startup. In these cases, you can use the command to increase the startup delay.

Use the **no** variant of this command to return to the default delay values.

Syntax log host startup-delay [delay <1-600>] [messages <1-5000>]
no log host startup-delay

Parameter	Description
delay <1-600>	The time, in seconds, from when syslog starts before the device attempts to filter and transmit the buffered messages to remote hosts.
messages <1-5000>	The maximum number of messages that the device will buffer during the delay period.

Default By default the system will buffer up to 2000 messages and wait 120 seconds from when syslog starts before attempting to filter and transmit the buffered messages to remote hosts.

Mode Global Configuration

Example To increase the delay to 180 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# log host startup-delay delay 180
```

Related commands

- default log host**
- log host (filter)**
- log host exclude**
- log host source**
- log host time**
- log trustpoint**
- show log config**

Command changes Version 5.4.8-0.2: defaults changed

log host time

Overview This command configures the time used in messages sent to a remote syslog server. If the syslog server is in a different time zone to your device then the time offset can be configured using either the **utc-offset** parameter option keyword or the **local-offset** parameter option keyword, where **utc-offset** is the time difference from UTC (Universal Time, Coordinated) and **local-offset** is the difference from local time.

Syntax `log host {<hostname>|<ipv4-addr>|<ipv6-addr>} time {local|local-offset|utc-offset {plus|minus} <0-24>}`

Parameter	Description
<hostname>	The host name of a remote syslog server.
<ipv4-addr>	The IPv4 address of a remote syslog server, in A.B.C.D format.
<ipv6-addr>	The IPv6 address of a remote syslog server, in X:X::X:X format.
<email-address>	The email address to send log messages to
time	Specify the time difference between the email recipient and the device you are configuring.
local	The device is in the same time zone as the email recipient
local-offset	The device is in a different time zone to the email recipient. Use the plus or minus keywords and specify the difference (offset) from local time of the device to the email recipient in hours.
utc-offset	The device is in a different time zone to the email recipient. Use the plus or minus keywords and specify the difference (offset) from UTC time of the device to the email recipient in hours.
plus	Negative offset (difference) from the device to the syslog server.
minus	Positive offset (difference) from the device to the syslog server.
<0-24>	World Time zone offset in hours

Default The default is **local** time.

Mode Global Configuration

Usage notes Use the **local** option if the remote syslog server is in the same time zone as the device. Messages will display the time as on the local device when the message was generated.

Use the **offset** option if the email recipient is in a different time zone to this device. Specify the time offset of the remote syslog server in hours. Messages will display the time they were generated on this device but converted to the time zone of the remote syslog server.

Examples To send messages to the remote syslog server with the IP address 10.32.16.21 in the same time zone as the device's local time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.21 time local 0
```

To send messages to the remote syslog server with the IP address 10.32.16.12 with the time information converted to the time zone of the remote syslog server, which is 3 hours ahead of the device's local time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.12 time local-offset plus 3
```

To send messages to the remote syslog server with the IP address 10.32.16.02 with the time information converted to the time zone of the email recipient, which is 3 hours behind the device's UTC time zone, use the following commands:

```
awplus# configure terminal
awplus(config)# log host 10.32.16.02 time utc-offset minus 3
```

Related commands

- [default log host](#)
- [log host](#)
- [log host \(filter\)](#)
- [log host exclude](#)
- [log host source](#)
- [show log config](#)

Command changes Version 5.5.2-1.1: **vrf** parameter added for products that support VRF

log monitor (filter)

Overview This command creates a filter to select messages to be sent to the terminal when the **terminal monitor** command is given. Selection can be based on the priority/severity of the message, the program that generated the message, the logging facility used, a sub-string within the message or a combination of some or all of these.

Syntax log monitor [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log monitor [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Filter messages by severity level.																
<level>	The minimum severity of message to send. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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program	Filter messages by program. Include messages from a specified program.																
<program- name>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> <tr> <td>rsvp</td><td>Resource Reservation Protocol (RSVP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)	rsvp	Resource Reservation Protocol (RSVP)				
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Filter messages by syslog facility.
<facility>	Specify one of the following syslog facilities to include messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default By default there is a filter to select all messages. This filter may be removed and replaced by filters that are more selective.

Mode Global Configuration

Examples To create a filter to send all messages that are generated by authentication and have a severity of **info** or higher to terminal instances where the terminal monitor command has been given, use the following commands:

```
awplus# configure terminal
awplus(config)# log monitor level info program auth
```

To remove a filter that sends all messages generated by EPSR that have a severity of **notices** or higher to the terminal, use the following commands:

```
awplus# configure terminal
awplus(config)# no log monitor level notices program epsr
```

To remove a default filter that includes sending everything to the terminal, use the following commands:

```
awplus# configure terminal
awplus(config)# no log monitor level debugging
```


Related
commands

- default log monitor**
- log monitor exclude**
- show log config**
- terminal monitor**

log monitor exclude

Overview Use this command to prevent specified log messages from being displayed on a terminal, when **terminal monitor** is enabled. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax log console exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log console exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
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loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log monitor exclude msgtext example of
irrelevant message
```

Related commands

- [default log monitor](#)
- [log monitor \(filter\)](#)
- [show log config](#)
- [terminal monitor](#)

log permanent

Overview This command configures the device to send permanent log messages to non-volatile storage (NVS) on the device. The content of the permanent log is retained over a reboot. Once the permanent log reaches its configured maximum allowable size old messages will be deleted to make way for new messages.

The **no** variant of this command configures the device not to send any messages to the permanent log. Log messages will not be retained over a restart.

Syntax log permanent
no log permanent

Mode Global Configuration

Examples To enable permanent logging use the following commands:

```
awplus# configure terminal  
awplus(config)# log permanent
```

To disable permanent logging use the following commands:

```
awplus# configure terminal  
awplus(config)# no log permanent
```

Related commands

- clear log permanent**
- copy permanent-log**
- default log permanent**
- log permanent (filter)**
- log permanent exclude**
- log permanent size**
- show log config**
- show log permanent**

log permanent (filter)

Overview This command creates a filter to select messages to be sent to the permanent log. Selection can be based on the priority/ severity of the message, the program that generated the message, the logging facility used, a sub-string within the message or a combination of some or all of these.

The **no** variant of this command removes the corresponding filter, so that the specified messages are no longer sent to the permanent log.

Syntax log permanent [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log permanent [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]

Parameter	Description
level	Filter messages sent to the permanent log by severity level.
<level>	The minimum severity of message to send. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity:
0|emergencies	System is unusable
1|alerts	Action must be taken immediately
2|critical	Critical conditions
3|errors	Error conditions
4|warnings	Warning conditions
5|notices	Normal, but significant, conditions
6|informational	Informational messages
7|debugging	Debug-level messages
program	Filter messages by program. Include messages from a specified program.
<program- name>	The name of a program to log messages from. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The pre-defined names are not case sensitive but other program names from the log output are.
rip	Routing Information Protocol (RIP)
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ospf	Open Shortest Path First (OSPF)
ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)
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pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
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Parameter	Description
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authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Select messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default By default the buffered log has a filter to select messages whose severity level is notices (5) or higher. This filter may be removed using the **no** variant of this command.

Mode Global Configuration

Examples To create a filter to send all messages generated by EPSR that have a severity of notices or higher to the permanent log use the following commands:

```
awplus# configure terminal
awplus(config)# log permanent level notices program epsr
```

To create a filter to send all messages containing the text "Bridging initialization", to the permanent log use the following commands:

```
awplus# configure terminal
awplus(config)# log permanent msgtext Bridging initialization
```

Related commands

- clear log permanent**
- default log permanent**
- log permanent**
- log permanent exclude**
- log permanent size**
- show log config**
- show log permanent**

log permanent exclude

Overview Use this command to prevent specified log messages from being sent to the permanent log. You can exclude messages on the basis of:

- the priority/severity of the message
- the program that generated the message
- the logging facility used
- a sub-string within the message, or
- a combination of some or all of these.

Use the **no** variant of this command to stop excluding the specified messages.

Syntax `log permanent exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]
no log permanent exclude [level <level>] [program <program-name>]
[facility <facility>] [msgtext <text-string>]`

Parameter	Description																
level	Exclude messages of the specified severity level.																
<level>	The severity level to exclude. The level can be specified as one of the following numbers or level names, where 0 is the highest severity and 7 is the lowest severity: <table> <tr> <td>0 emergencies</td><td>System is unusable</td></tr> <tr> <td>1 alerts</td><td>Action must be taken immediately</td></tr> <tr> <td>2 critical</td><td>Critical conditions</td></tr> <tr> <td>3 errors</td><td>Error conditions</td></tr> <tr> <td>4 warnings</td><td>Warning conditions</td></tr> <tr> <td>5 notices</td><td>Normal, but significant, conditions</td></tr> <tr> <td>6 informational</td><td>Informational messages</td></tr> <tr> <td>7 debugging</td><td>Debug-level messages</td></tr> </table>	0 emergencies	System is unusable	1 alerts	Action must be taken immediately	2 critical	Critical conditions	3 errors	Error conditions	4 warnings	Warning conditions	5 notices	Normal, but significant, conditions	6 informational	Informational messages	7 debugging	Debug-level messages
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7 debugging	Debug-level messages																
program	Exclude messages from a specified program.																
<program- name>	The name of a program. You can enter either one of the following predefined program names (depending on your device model), or another program name that you find in the log output. The predefined names are not case sensitive but other program names from the log output are. <table> <tr> <td>rip</td><td>Routing Information Protocol (RIP)</td></tr> <tr> <td>ripng</td><td>Routing Information Protocol - next generation (RIPng)</td></tr> <tr> <td>ospf</td><td>Open Shortest Path First (OSPF)</td></tr> <tr> <td>ospfv3</td><td>Open Shortest Path First (OSPF) version 3 (OSPFv3)</td></tr> <tr> <td>bgp</td><td>Border Gateway Protocol (BGP)</td></tr> <tr> <td>rsvp</td><td>Resource Reservation Protocol (RSVP)</td></tr> </table>	rip	Routing Information Protocol (RIP)	ripng	Routing Information Protocol - next generation (RIPng)	ospf	Open Shortest Path First (OSPF)	ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)	bgp	Border Gateway Protocol (BGP)	rsvp	Resource Reservation Protocol (RSVP)				
rip	Routing Information Protocol (RIP)																
ripng	Routing Information Protocol - next generation (RIPng)																
ospf	Open Shortest Path First (OSPF)																
ospfv3	Open Shortest Path First (OSPF) version 3 (OSPFv3)																
bgp	Border Gateway Protocol (BGP)																
rsvp	Resource Reservation Protocol (RSVP)																

Parameter	Description
pim-dm	Protocol Independent Multicast - Dense Mode (PIM-DM)
pim-sm	Protocol Independent Multicast - Sparse Mode (PIM-SM)
pim-smv6	PIM-SM version 6 (PIM-SMv6)
dot1x	IEEE 802.1X Port-Based Access Control
lacp	Link Aggregation Control Protocol (LACP)
stp	Spanning Tree Protocol (STP)
rstp	Rapid Spanning Tree Protocol (RSTP)
mstp	Multiple Spanning Tree Protocol (MSTP)
imi	Integrated Management Interface (IMI)
imish	Integrated Management Interface Shell (IMISH)
epsr	Ethernet Protection Switched Rings (EPSR)
irdp	ICMP Router Discovery Protocol (IRDP)
rmon	Remote Monitoring
loopprot	Loop Protection
poe	Power-inline (Power over Ethernet)
dhcpsn	DHCP snooping (DHCP SN)
facility	Exclude messages from a syslog facility.
<facility>	Specify one of the following syslog facilities to exclude messages from:
kern	Kernel messages
user	Random user-level messages

Parameter	Description
mail	Mail system
daemon	System daemons
auth	Security/authorization messages
syslog	Messages generated internally by syslogd
lpr	Line printer subsystem
news	Network news subsystem
uucp	UUCP subsystem
cron	Clock daemon
authpriv	Security/authorization messages (private)
ftp	FTP daemon
msgtext	Exclude messages containing a certain text string.
<text- string>	A text string to match (maximum 128 characters). This is case sensitive, and must be the last text on the command line.

Default No log messages are excluded

Mode Global configuration

Example To remove messages that contain the string “example of irrelevant message”, use the following commands:

```
awplus# configure terminal
awplus(config)# log permanent exclude msgtext example of
irrelevant message
```

Related commands

- [clear log permanent](#)
- [default log permanent](#)
- [log permanent](#)
- [log permanent \(filter\)](#)
- [log permanent size](#)
- [show log config](#)
- [show log permanent](#)

log permanent size

Overview This command configures the amount of memory that the permanent log is permitted to use. Once this memory allocation has been filled, old messages will be deleted to make room for new messages.

Use the **no** variant of this command to return to the default.

Syntax log permanent size <50-250>

no log permanent size

Parameter	Description
<50-250>	Size of the permanent log in kilobytes

Default 50 kilobytes

Mode Global Configuration

Example To allow the permanent log to use up to 100 kilobytes of NVS, use the commands:

```
awplus# configure terminal
awplus(config)# log permanent size 100
```

To return to the default value, use the commands:

```
awplus# configure terminal
awplus(config)# no log permanent size
```

Related commands

- clear log permanent**
- copy permanent-log**
- default log permanent**
- log permanent**
- log permanent (filter)**
- log permanent exclude**
- show log config**
- show log permanent**

Command changes Version 5.5.3-2.1: Maximum and default size increased on AMFCloud and AR4000S-Cloud

log-rate-limit nsm

Overview This command limits the number of log messages generated by the device for a specified time interval.

Use the **no** variant of this command to revert to the default number of log messages, which is up to 200 log messages per second.

Syntax `log-rate-limit nsm messages <message-limit> interval <time-interval>`
`no log-rate-limit nsm`

Parameter	Description
<code><message-limit></code>	<code><1-65535></code> The number of log messages generated by the device.
<code><time-interval></code>	<code><0-65535></code> The time period for log message generation in 1/100 seconds. If an interval of 0 is specified then no log message rate limiting is applied.

Default By default, the device will allow 200 log messages to be generated per second.

Mode Global Configuration

Usage notes This command limits the rate that log messages are generated. Limiting log messages protects the device from running out of memory in extreme conditions, such as during a broadcast storm.

Once the specified number of log messages per interval is exceeded, any excess log messages are dropped. When this occurs a summary log message is generated at the end of the interval. This summary message includes the number of log messages dropped.

If you expect a lot of dropped log messages, we recommend setting the time interval to no less than 100. This limits the number of summary messages to one per second, which prevents the log from filling up with these summary messages.

Examples To allow the device to generate a maximum of 300 log messages per second, use the following commands:

```
awplus# configure terminal
awplus(config)# log-rate-limit nsm messages 300 interval 100
```

To return the device to the default setting, use the following commands:

```
awplus# configure terminal
awplus(config)# no log-rate-limit nsm
```

log trustpoint

Overview This command adds one or more trustpoints to be used with the syslog application. Multiple trustpoints may be specified, or the command may be executed multiple times, to add multiple trustpoints to the application.

The **no** version of this command removes one or more trustpoints from the list of trustpoints associated with the application.

Syntax log trustpoint [*<trustpoint-list>*]
no log trustpoint [*<trustpoint-list>*]

Parameter	Description
<i><trustpoint-list></i>	Specify one or more trustpoints to be added or deleted.

Default No trustpoints are created by default.

Mode Global Configuration

Usage notes The device certificate associated with first trustpoint added to the application will be transmitted to remote servers. The certificate received from the remote server must have an issuer chain that terminates with the root CA certificate for any of the trustpoints that are associated with the application.

If no trustpoints are specified in the command, the trustpoint list will be unchanged.

If **no log trustpoint** is issued without specifying any trustpoints, then all trustpoints will be disassociated from the application.

Example You can add multiple trustpoints by executing the command multiple times:

```
awplus# configure terminal
awplus(config)# log trustpoint trustpoint_1
awplus(config)# log trustpoint trustpoint_2
```

Alternatively, add multiple trustpoints with a single command:

```
awplus(config)# log trustpoint trustpoint_2 trustpoint_3
```

Disassociate all trustpoints from the syslog application using the command:

```
awplus(config)# log trustpoint trustpoint_2 trustpoint_3
```

Related **log host**
commands **show log config**

show counter log

Overview This command displays log counter information.

Syntax show counter log

Mode User Exec and Privileged Exec

Example To display the log counter information, use the command:

```
awplus# show counter log
```

Output The following shows typical output.

Example output from the show counter log command

Log counters		
Total Received	.....	2328
Total Received P0	.....	0
Total Received P1	.....	0
Total Received P2	.....	1
Total Received P3	.....	9
Total Received P4	.....	32
Total Received P5	.....	312
Total Received P6	.....	1602
Total Received P7	.....	372

Parameters in output of the show counter log command

Parameter	Description
Total Received	Total number of messages received by the log
Total Received P0	Total number of Priority 0 (Emergency) messages received
Total Received P1	Total number of Priority 1 (Alert) messages received
Total Received P2	Total number of Priority 2 (Critical) messages received
Total Received P3	Total number of Priority 3 (Error) messages received
Total Received P4	Total number of Priority 4 (Warning) messages received
Total Received P5	Total number of Priority 5 (Notice) messages received
Total Received P6	Total number of Priority 6 (Info) messages received
Total Received P7	Total number of Priority 7 (Debug) messages received

Related commands [show log config](#)

show exception log

Overview This command displays the contents of the exception log. If the device has unexpectedly restarted and has produced a core dump file, the output of this command shows the name and location of the file.

Syntax show exception log

Mode User Exec and Privileged Exec

Example To display the exception log, use the command:

```
awplus# show exception log
```

Output The following shows typical output.

Example output from the show exception log command on a device that has never had an exception occur

```
awplus#show exception log
<date> <time> <facility>.<severity> <program[<pid>]>: <message>
-----
None
-----
awplus#
```

show log

Overview This command displays the contents of the buffered log.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#).

Syntax show log [tail [<10-250>]]

Parameter	Description
tail	Display only the latest log entries.
<10-250>	Specify the number of log entries to display.

Default By default the entire contents of the buffered log is displayed.

Mode User Exec, Privileged Exec and Global Configuration

Usage notes If the optional **tail** parameter is specified, only the latest 10 messages in the buffered log are displayed. A numerical value can be specified after the **tail** parameter to select how many of the latest messages should be displayed.

The **show log** command is only available to users at privilege level 7 and above. To set a user’s privilege level, use the command:

```
awplus(config)# username <name> privilege <1-15>
```

Examples To display the contents of the buffered log use the command:

```
awplus# show log
```

To display the 10 latest entries in the buffered log use the command:

```
awplus# show log tail 10
```


Output The following shows typical output.

Example output from show log

```
awplus#show log
<date> <time> <facility>.<severity> <program[<pid>]>: <message>
-----
2023 Jun 05 23:06:48 syslog.notice awplus syslog-ng[1080]: syslog-ng starting up;
version='3.10.1'
2023 Jun 05 23:06:48 kern.warning awplus kernel: pxa3xx-nand f10d0000.nand: This
platform can't do DMA on this device
2023 Jun 05 23:06:48 kern.notice awplus kernel: 3 ofpart partitions found on MTD
device pxa3xx_nand-0
2023 Jun 05 23:06:48 kern.notice awplus kernel: 4 ofpart partitions found on MTD
device spi0.0
2023 Jun 05 23:06:48 kern.notice awplus kernel: 1 ofpart partitions found on MTD
device spi0.1
2023 Jun 05 23:06:48 kern.notice awplus kernel: Registering SWP/SWPB emulation
handler
2023 Jun 05 23:06:48 kern.notice awplus kernel: RAMDISK: squashfs filesystem found
at block 0
...
```

Related commands

- [clear log buffered](#)
- [copy buffered-log](#)
- [default log buffered](#)
- [log buffered](#)
- [log buffered \(filter\)](#)
- [log buffered size](#)
- [log buffered exclude](#)
- [show log config](#)

show log config

Overview This command displays information about the logging system. This includes the configuration of the various log destinations, such as buffered, permanent, syslog servers (hosts) and email addresses. This also displays the latest status information for each log destination.

Syntax show log config

Mode User Exec, Privileged Exec and Global Configuration

Example To display the logging configuration use the command:

```
awplus# show log config
```

Output The following shows typical output.

Example output from show log config

```
Facility: default
PKI trustpoints: example_trustpoint

Buffered log:
Status ..... enabled
Maximum size ... 100kb
Filters:
*1 Level ..... notices
  Program ..... any
  Facility ..... any
  Message text . any
  2 Level ..... informational
    Program ..... auth
    Facility ..... daemon
    Message text . any
  Statistics ..... 1327 messages received, 821 accepted by filter (2016 Oct 11
10:36:16)

Permanent log:
Status ..... enabled
Maximum size ... 60kb
Filters:
  1 Level ..... error
    Program ..... any
    Facility ..... any
    Message text . any
  *2 Level ..... warnings
    Program ..... dhcp
    Facility ..... any
    Message text . "pool exhausted"
  Statistics ..... 1327 messages received, 12 accepted by filter (2016 Oct 11
10:36:16)

Host 10.32.16.21:
Time offset .... +2:00
Offset type .... UTC
Source ..... -
Secured ..... enabled
Filters:
  1 Level ..... critical
    Program ..... any
    Facility ..... any
    Message text . any
  Statistics ..... 1327 messages received, 1 accepted by filter (2016 Oct 11
10:36:16)

Email admin@alliedtelesis.com:
Time offset .... +0:00
Offset type .... Local
Filters:
  1 Level ..... emergencies
    Program ..... any
    Facility ..... any
    Message text . any
  Statistics ..... 1327 messages received, 0 accepted by filter (2016 Oct 11
10:36:16)
...
```

In the above example the '*' next to filter 1 in the buffered log configuration indicates that this is the default filter. The permanent log has had its default filter removed, so none of the filters are marked with '*'.

NOTE: *Terminal log and console log cannot be set at the same time. If console logging is enabled then the terminal logging is turned off.*

Related commands

- show counter log**
- show log**
- show log permanent**

show log external

Overview Use this command to display the contents of the external log, which is stored on a USB storage device.

Syntax `show log external [tail [<10-250>]]`

Parameter	Description
tail	Display only the latest log entries.
<10-250>	Specify the number of log entries to display.

Mode Global Configuration

Privileged Exec

User Exec

Usage notes If the optional **tail** parameter is specified, only the latest 10 messages in the permanent log are displayed. A numerical value can be specified after the **tail** parameter to change how many of the latest messages should be displayed.

Example To display the last 5 entries in the external log, use the command:

```
awplus# show log external tail 5
```

Related commands

- [clear log external](#)
- [default log external](#)
- [log external](#)
- [log external \(filter\)](#)
- [log external exclude](#)
- [log external rotate](#)
- [log external size](#)
- [show log config](#)
- [unmount](#)

Command changes Version 5.4.7-1.1: command added

show log permanent

Overview This command displays the contents of the permanent log.

Syntax show log permanent [tail [<10-250>]]

Parameter	Description
tail	Display only the latest log entries.
<10-250>	Specify the number of log entries to display.

Usage notes If the optional **tail** parameter is specified, only the latest 10 messages in the permanent log are displayed. A numerical value can be specified after the **tail** parameter to change how many of the latest messages should be displayed.

Mode User Exec, Privileged Exec and Global Configuration

Example To display the permanent log, use the command:

```
awplus# show log permanent
```

Output The following shows typical output.

Example output from show log permanent

```
awplus#show log permanent 2
Stack member 2:
<date> <time> <facility>.<severity> <program[<pid>]>: <message>
-----
2025 Apr 25 09:10:48 daemon.crit awplus-2 HPI: HOTSWAP Pluggable 2.0.51 hotswapped
in: AT-StackXS/1.0
2025 Apr 25 09:10:48 daemon.crit awplus-2 HPI: HOTSWAP Pluggable 2.0.52 hotswapped
in: 2127931-2
2025 Apr 25 09:10:50 user.crit awplus-2 VCS[922]: Member 1 (eccd.6d7d.a50e) has
joined the stack
2025 Apr 25 09:10:52 user.crit awplus-2 VCS[922]: Member 1 (eccd.6d7d.a50e) has
become the Active Master
2025 Apr 25 09:10:52 local6.alert awplus-2 VCS[922]: stack member has booted from
non-default location, SW version auto synchronization cannot be supported.
2025 Apr 25 09:10:52 user.crit awplus-2 VCS[922]: Stack Virtual MAC is
0000.cd37.0002
2025 Apr 25 09:11:46 user.crit awplus-2 ATMF[862]: awplus-x510 has joined. 1
member in total.
```

Related commands

- clear log permanent**
- copy permanent-log**
- default log permanent**
- log permanent**
- log permanent (filter)**
- log permanent exclude**
- log permanent size**
- show log config**

show running-config log

Overview This command displays the current running configuration of the Log utility.

Syntax show running-config log

Mode Privileged Exec and Global Configuration

Example To display the current configuration of the log utility, use the command:

```
awplus# show running-config log
```

Related commands [show log](#)
[show log config](#)

unmount

Overview Use this command to unmount an external storage device. We recommend you unmount storage devices before removing them, to avoid file corruption. This is especially important if files may be automatically written to the storage device, such as external log files or AMF backup files.

Syntax `unmount usb`

Parameter	Description
usb	Unmount the USB storage device.

Mode Privileged Exec

Example To unmount a USB storage device and safely remove it from the device, use the command:

```
awplus# unmount usb
```

Related commands

- [clear log external](#)
- [log external](#)
- [show file systems](#)
- [show log config](#)
- [show log external](#)

Command changes Version 5.4.7-1.1: command added

10

Scripting Commands

- Contents**
- **Introduction** on page 495
 - **activate** on page 496
 - **echo** on page 498
 - **wait** on page 499

Introduction

Overview This chapter provides commands used for command scripts.

Command List

activate

Overview This command activates a script file.

Syntax activate [background] <script>

Parameter	Description
background	Activate a script to run in the background. A process that is running in the background will operate as a separate task, and will not interrupt foreground processing. Generally, we recommend running short, interactive scripts in the foreground and longer scripts in the background. The default is to run the script in the foreground.
<script>	The file name of the script to activate. The script is a command script consisting of commands documented in this software reference. Note that you must use either a .scp or a .sh filename extension for a valid script text file, as described below in the usage section for this command.

Mode Privileged Exec

Usage notes When a script is activated, the privilege level is set to 1 enabling User Exec commands to run in the script. If you need to run Privileged Exec commands in your script you need to add an **enable (Privileged Exec mode)** command to the start of your script. If you need to run Global Configuration commands in your script you need to add a **configure terminal** command after the **enable** command at the start of your script.

The **activate** command executes the script in a new shell. A **terminal length** shell command, such as **terminal length 0** may also be required to disable a delay that would pause the display.

A script must be a text file with a filename extension of either **.sh** or **.scp** only for the AlliedWare Plus CLI to activate the script file. The **.sh** filename extension indicates the file is an ASH script, and the **.scp** filename extension indicates the file is an AlliedWare Plus script. You can't use ASH scripts when the device is in Secure Mode.

Examples To activate a command script to run as a background process, use the command:

```
awplus#activate background test.scp
```

Related commands

- configure terminal**
- echo**
- enable (Privileged Exec mode)**
- wait**

echo

Overview This command echoes a string to the terminal, followed by a blank line.

Syntax `echo <line>`

Parameter	Description
<line>	The string to echo

Mode User Exec and Privileged Exec

Usage This command may be useful in CLI scripts, to make the script print user-visible comments.

Example To echo the string Hello World to the console, use the command:

```
awplus# echo Hello World
```

Output

```
Hello World
```

Related commands [activate](#)
[wait](#)

wait

Overview This command pauses execution of the active script for the specified period of time.

Syntax wait <delay>

Parameter	Description
<delay>	<1 - 65535> Specify the time delay in seconds

Default No wait delay is specified by default.

Mode Privileged Exec (when executed from a script not directly from the command line)

Usage notes Use this command to pause script execution in an **.scp** (AlliedWare Plus™ script) or an **.sh** (ASH script) file executed by the **activate** command. The script must contain an **enable** command, because the **wait** command is only executed in the Privileged Exec mode.

Example See an **.scp** script file extract below that will show port counters for interface port1.0.2 over a 10 second interval:

```
enable
show interface port1.0.2
wait 10
show interface port1.0.2
```

Related commands **activate**
echo
enable (Privileged Exec mode)

11

Interface Commands

- Contents**
- **Introduction** on page 501
 - **description (interface)** on page 502
 - **interface (to configure)** on page 503
 - **mtu** on page 505
 - **platform jumboframe** on page 507
 - **service statistics interfaces counter** on page 508
 - **show interface** on page 509
 - **show interface brief** on page 512
 - **show interface memory** on page 513
 - **show interface status** on page 515
 - **shutdown** on page 518

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure and display interfaces.

description (interface)

Overview Use this command to add a description to a specific port or interface.

Syntax `description <description>`

Parameter	Description
<code><description></code>	Text describing the specific interface. Descriptions can contain any printable ASCII characters (ASCII 32-126).

Mode Interface Configuration

Example The following example uses this command to describe the device that an interface is connected to.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# description Boardroom PC
```

Command changes Version 5.4.7-1.1: valid character set changed to printable ASCII characters

interface (to configure)

Overview Use this command to select one or more interfaces to configure.

Syntax `interface <interface-list>`

Parameter	Description
<code><interface-list></code>	The interfaces to configure. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. The specified interfaces must exist.

Usage notes A local loopback interface is one that is always available for higher layer protocols to use and advertise to the network. Although a local loopback interface is assigned an IP address, it does not have the usual requirement of connecting to a lower layer physical entity. This lack of physical attachment creates the perception of a local loopback interface always being accessible via the network.

Local loopback interfaces can be utilized by a number of protocols for various purposes. They can be used to improve access to the device and also increase its reliability, security, scalability and protection. In addition, local loopback interfaces can add flexibility and simplify management, information gathering and filtering.

One example of this increased reliability is for OSPF to advertise a local loopback interface as an interface-route into the network irrespective of the physical links that may be 'up' or 'down' at the time. This provides a higher probability that the routing traffic will be received and subsequently forwarded.

Mode Global Configuration

Examples The following example shows how to enter Interface mode to configure VLAN interface vlan1. Note how the prompt changes.

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)#
```

The following example shows how to enter Interface mode to configure the local loopback interface.

```
awplus# configure terminal
awplus(config)# interface lo
awplus(config-if)#
```

Related commands

- ip address (IP Addressing and Protocol)**
- show interface**
- show interface brief**

mtu

Overview Use this command to set the Maximum Transmission Unit (MTU) size for interfaces, where MTU is the maximum packet size that interfaces can transmit. The MTU size setting is applied to both IPv4 and IPv6 packet transmission.

Use the **no** variant of this command to remove a previously specified Maximum Transmission Unit (MTU) size, and restore the default MTU size. For example, the VLAN interface default is 1500 bytes.

Syntax `mtu <68-1582>`
`no mtu`

Parameter	Description
<68-1582>	The Maximum Transmission size in bytes.

Default The default MTU size, for example 1500 bytes for VLAN interfaces.

Mode Interface Configuration

Usage notes If a device receives an IPv4 packet for Layer 3 switching to another interface with an MTU size smaller than the packet size, and if the packet has the '**don't fragment**' bit set, then the device will send an ICMP '**destination unreachable**' (3) packet type and a '**fragmentation needed and DF set**' (4) code back to the source. For IPv6 packets bigger than the MTU size of the transmitting interface, an ICMP '**packet too big**' (ICMP type 2 code 0) message is sent to the source.

Note that **show interface** output will only show MTU size for VLAN interfaces.

Examples To configure an MTU size of 1555 bytes on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# mtu 1555
```

To restore the MTU size to the default MTU size of 1500 bytes on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no mtu
```

Related commands **show interface**

Command changes Version 5.4.7-1.1: Behavior change when MTU set to less than 1500 on FS980M and GS980M.

Version 5.5.1-0.1: Layer 3 jumbo frames supported on SBx908 GEN2 and x950.

Version 5.5.1-1.2: Layer 3 jumbo frames supported on x530 and GS980MX.

Version 5.5.3-1.x Layer 3 jumbo frames supported on x240, SE240, x250, SE250, x540L, SE540L.

Version 5.5.5-0.1 Layer 3 jumbo frames supported on XS900MX, x550, x930, SBx81CFC960.

platform jumboframe

Overview This command enables the device to forward jumbo frames. See the [Switching Feature Overview and Configuration Guide](#) for more information.

When jumbo frame support is enabled, the maximum size of packets that the device can forward is 10218 bytes of payload.

Use the **no** variant of this command to remove jumbo frame support. This stops the ports from forwarding packets larger than VLAN tagged frames (1522 bytes).

NOTE: The number above specifies the payload only. For an IEEE 802.1q frame, provision is made (internally) for the following additional components:

- Source and Destination addresses
- EtherType field
- Priority and VLAN tag fields
- FCS

These additional components increase the frame size (to 1522 bytes in the default case).

Syntax platform jumboframe
no platform jumboframe

Default By default, jumbo frames is off.

Mode Global Configuration

Usage notes You must save the configuration and restart the device after entering this command for it to take effect. You can use the [reboot](#) command to restart the device.

Example To enable the device to forward jumbo frames, use the following commands:

```
awplus# configure terminal
awplus(config)# platform jumboframe
```

Related commands [show platform](#)
[show running-config](#)

service statistics interfaces counter

Overview Use this command to enable the interface statistics counter.
Use the **no** variant of this command to disable the interface statistics counter.

Syntax service statistics interfaces counter
no service statistics interfaces counter

Default The interface statistics counter is enabled by default.

Mode Global Configuration

Example To enable the interface statistics counter, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# service statistics interfaces counter
```

To disable the interface statistics counter, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no service statistics interfaces counter
```

Command changes Version 5.4.7-2.1: command added

show interface

Overview Use this command to display interface configuration and status.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show interface [*<interface-list>*]

Parameter	Description
<i><interface-list></i>	The interfaces or ports to display. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. The specified interfaces must exist.

Mode User Exec and Privileged Exec

Usage notes Note that the output displayed with this command will show MTU (Maximum Transmission Unit) size for VLAN interfaces, and MRU (Maximum Received Unit) size for switch ports.

Example To display configuration and status information for all interfaces, use the command:

```
awplus# show interface
```

To display configuration and status information for the loopback interface lo, use the command:

```
awplus# show interface lo
```

To display configuration and status information for interface vlan1, use the command:

```
awplus# show interface vlan1
```

Output The following shows typical output.

Example output from the show interface command:

```
awplus#show interface
Interface port1.0.1
  Link is UP, administrative state is UP
  Hardware is Ethernet, address is 0000.cd38.026c
  index 5001 metric 1 mru 1500
  current duplex full, current speed 1000, current polarity mdix
  configured duplex auto, configured speed auto, configured polarity auto
  <UP,BROADCAST,RUNNING,MULTICAST>
  SNMP link-status traps: Disabled
    input packets 2927667, bytes 224929311, dropped 0, multicast packets 1242629
    output packets 378084, bytes 54372424, multicast packets 1, broadcast packets 10
    input average rate : 30 seconds 5.19 Kbps, 5 minutes 8.16 Kbps
    output average rate: 30 seconds 6.04 Kbps, 5 minutes 73.89 Kbps
    input peak rate 268.60 Kbps at 2018/04/10 17:46:43
    output peak rate 6.81 Mbps at 2018/04/10 18:15:44
  Time since last state change: 7 days 01:58:10
  ...
```

Example output from the show interface lo command:

```
awplus#show interface lo
Interface lo
  Scope: both
  Link is UP, administrative state is UP
  Hardware is Loopback
  index 1 metric 1
  <UP,LOOPBACK,RUNNING>
  SNMP link-status traps: Disabled
  Router Advertisement is disabled
  Router Advertisement default routes are accepted
  Router Advertisement prefix info is accepted
  Time since last state change: 8 days 00:01:09
```

Example output from the show interface vlan1 command:

```
awplus#show interface vlan1
Interface vlan1
  Link is UP, administrative state is UP
  Hardware is VLAN, address is 0000.cd38.026c
  IPv4 address 192.168.1.1/24 broadcast 192.168.1.255
  index 301 metric 1 mtu 1500
  arp ageing timeout 300
  <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  SNMP link-status traps: Disabled
  Router Advertisement is disabled
  Router Advertisement default routes are accepted
  Router Advertisement prefix info is accepted
    input packets 0, bytes 0, dropped 0, multicast packets 0
    output packets 9, bytes 612, multicast packets 0, broadcast packets 0
    input average rate : 30 seconds 0 bps, 5 minutes 0 bps
    output average rate: 30 seconds 0 bps, 5 minutes 0 bps
    output peak rate 140 bps at 2018/04/10 16:40:56
  Time since last state change: 8 days 19:09:19
```

Related commands [ecofriendly lpi](#)
[mtu](#)
[show interface brief](#)
[show interface status](#)

Command changes Version 5.4.7-2.1: average rate and peak rate added to output

show interface brief

Overview Use this command to display brief interface, configuration, and status information, including provisioning information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show interface brief

Mode User Exec and Privileged Exec

Example To display summarized information about all interfaces on the device, use the command:

```
awplus# show interface brief
```

Output The following shows typical output.

Example output from show interface brief

awplus#show interface brief		
Interface	Status	Protocol
port1.0.1	admin up	down
port1.0.2	admin up	down
port1.0.3	admin up	down
port1.0.4	admin up	down
port1.0.5	admin up	down
port1.0.6	admin up	running
lo	admin up	running
vlan1	admin up	down
vlan2	admin up	down

Parameters in the output of show interface brief

Parameter	Description
Interface	The name or type of interface.
Status	The administrative state. This can be either admin up or admin down .
Protocol	The link state. This can be either down , running , or provisioned .

Related commands [show interface](#)
[show interface status](#)
[show interface memory](#)

show interface memory

Overview This command displays the shared memory used by either all interfaces, or the specified interface or interfaces. The output is useful for diagnostic purposes by Allied Telesis authorized service personnel.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show interface memory
show interface *<port-list>* memory

Parameter	Description
<i><port-list></i>	Display information about only the specified port or ports. The port list can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.

Mode User Exec and Privileged Exec

Example To display the shared memory used by all interfaces, use the command:

```
awplus# show interface memory
```

To display the shared memory used by port1.0.1 and port1.0.3 to port1.0.4, use the command:

```
awplus# show interface port1.0.1,port1.0.3-port1.0.4 memory
```

Output The following shows typical output.

Example output from the show interface memory command

```
awplus#show interface memory
Vlan blocking state shared memory usage
-----
```

Interface	shmid	Bytes Used	nattch	Status
port1.0.1	491535	512	1	
port1.0.2	393228	512	1	
port1.0.3	557073	512	1	
...				
lo	425997	512	1	
po1	1179684	512	1	
po2	1212453	512	1	
sa3	1245222	512	1	

Example output from show interface <port-list> memory for a list of interfaces

```
awplus#show interface port1.0.1,port1.0.3-port1.0.4 memory
Vlan blocking state shared memory usage
-----
```

Interface	shmid	Bytes Used	nattch	Status
port1.0.1	589842	512	1	
port1.0.3	688149	512	1	
port1.0.4	327690	512	1	

Related commands [show interface brief](#)
[show interface status](#)
[show interface switchport](#)

show interface status

Overview Use this command to display the status of the specified interface or interfaces. Note that when no interface or interfaces are specified then the status of all interfaces on the device are shown.

Syntax `show interface [<port-list>] status`

Parameter	Description
<code><port-list></code>	The ports to display information about. The port list can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.

Mode User Exec and Privileged Exec

Examples To display the status of port1.0.1 to port1.0.3, use the command:

```
awplus# show interface port1.0.1-port1.0.3 status
```

To display the status of all ports, use the command:

```
awplus# show interface status
```

Output The following shows typical output.

Example output from the show interface <port-list> status command

```
awplus#show interface port1.0.1-port1.0.3 status
Port      Name      Status      Vlan Duplex  Speed Type
port1.0.1      notconnect      1 auto    auto 1000BASE-T
port1.0.2      notconnect      1 auto    auto 1000BASE-T
port1.0.3      notconnect      1 auto    auto 1000BASE-T
```

Example output from the show interface status command

```
awplus#show interface status
Port      Name      Status      Vlan Duplex  Speed Type
port1.0.1 Trunk_Net  connected    trunk a-full  a-1000 1000BaseTX
port1.0.2 Access_Net1  connected    1 full   1000 1000BaseTX
port1.0.3 Access_Net1  disabled     1 auto   auto 1000BaseTX
...
```

Parameters in the output from the show interface status command

Parameter	Description
Port	Name/Type of the interface.
Name	Description of the interface.
Status	The administrative and operational status of the interface; one of: - disabled: the interface is administratively down. - connect: the interface is operationally up. - notconnect: the interface is operationally down.
Vlan	VLAN type or VLAN IDs associated with the port: - When the VLAN mode is trunk, it displays trunk (it does not display the VLAN IDs). - When the VLAN mode is access, it displays the VLAN ID. - When the VLAN mode is private promiscuous, it displays the primary VLAN ID if it has one, and promiscuous if it does not have a VLAN ID. - When the VLAN mode is private host, it displays the primary and secondary VLAN IDs. - When the VLAN is dynamically assigned, it displays the current dynamically assigned VLAN ID (not the access VLAN ID), or dynamic if it has multiple VLANs dynamically assigned.
Duplex	The actual duplex mode of the interface, preceded by a- if it has autonegotiated this duplex mode. If the port is disabled or not connected, it displays the configured duplex setting.

Parameter	Description
Speed	The actual link speed of the interface, preceded by a- if it has autonegotiated this speed. If the port is disabled or not connected, it displays the configured speed setting.
Type	The type of interface, e.g. 1000BaseTX. For SFP bays, it displays Unknown if it does not recognize the type of SFP installed, or Not present if an SFP is not installed or is faulty.

Related commands [show interface](#)
[show interface brief](#)
[show interface memory](#)

shutdown

Overview This command shuts down the selected interface. This administratively disables the link and takes the link down at the physical (electrical) layer.

Use the **no** variant of this command to disable this function and bring the link back up again.

Syntax shutdown
no shutdown

Mode Interface Configuration

Usage notes If you shutdown an aggregator, the device shows the admin status of the aggregator and its component ports as "admin down". While the aggregator is down, the device accepts **shutdown** and **no shutdown** commands on component ports, but these have no effect on port status. Ports will not come up again while the aggregator is down.

Example To shut down port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# shutdown
```

To bring up port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no shutdown
```

To shut down vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# shutdown
```

To bring up vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no shutdown
```

12 Port Mirroring and Remote Mirroring Commands

- Contents**
- **Introduction** on page 520
 - **mirror interface** on page 521
 - **remote-mirror interface** on page 524
 - **show mirror** on page 527
 - **show mirror interface** on page 528
 - **show remote-mirror** on page 529
 - **switchport remote-mirror-egress** on page 532
 - **vlan mode remote-mirror-vlan** on page 533

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Port Mirroring and Remote Mirroring (also known as RSPAN). For more information, see the [Mirroring Feature Overview and Configuration Guide](#).

mirror interface

- Overview** Use this command to mirror traffic. Mirroring involves sending a copy of traffic from one port out another port, so it can be analyzed by a device attached to that port. Using this command allows you to specify:
- the mirror port - this is the port you specify when you enter interface configuration mode before entering this **mirror interface** command
 - the ports to mirror - these are the ports you specify in this command
 - the direction of traffic to mirror - received, transmitted, or both.

The mirror port is removed from all VLANs, and no longer participates in other switching.

Use the **no** variant of this command to disable port mirroring by the destination port on the specified source port.

Syntax mirror interface <source-port-list> direction {both|receive|transmit}
mirror interface none
no mirror interface <source-port-list>
no mirror interface none

Parameter	Description
<source-port-list>	The source switch ports to mirror. A port-list can be: • a port (e.g. port1.0.2) • a continuous range of ports separated by a hyphen, e.g. port1.0.1-port1.0.3 • a comma-separated list of ports and port ranges, e.g. port1.0.1,port1.0.2-port1.0.4 The source port list cannot include dynamic or static channel groups (link aggregators).
direction	Specifies whether to mirror traffic that the source port receives, transmits, or both.
both	Mirroring traffic both received and transmitted by the source port.
receive	Mirroring traffic received by the source port.
transmit	Mirroring traffic transmitted by the source port.
none	Specify this parameter for use with the copy-to-mirror parameter of: - the ACL (Access Control List) access-list and ipv6 access-list commands or - the QoS (Quality of Service) default action command. The none parameter lets you specify the destination port (the analyzer port) for the traffic without specifying a source mirror port.

Mode Interface Configuration

Usage notes A mirror port cannot be associated with a VLAN. If a switch port is configured to be a mirror port, it is automatically removed from any VLAN it was associated with.

This command can only be applied to a single mirror port, not to a range of ports, nor to a static or dynamic channel group.

You can use access control lists to mirror a subset of traffic from the mirrored port by using the copy-to-mirror parameter in hardware ACL commands.

For more information about mirroring, see the [Mirroring Feature Overview and Configuration Guide](#).

Example To mirror traffic received and transmitted on port1.0.1 to destination port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# mirror interface port1.0.1 direction both
```

To enable use with the [access-list \(numbered hardware ACL for IP packets\)](#) ACL and [default-action](#) QoS commands to destination port1.0.1 without specifying a source port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# mirror interface none
```

To mirror all received or transmitted TCP traffic to analyzer port1.0.1, use the sample configuration snippet below:

```
awplus#show running-config

mls qos enable
access-list 3000 copy-to-mirror tcp any any
access-group 3000
!
interface port1.0.1
 mirror interface none
```

Related commands [access-list \(numbered hardware ACL for IP packets\)](#)
[access-list \(numbered hardware ACL for MAC addresses\)](#)
[default-action](#)
[ipv6 access-list \(named IPv6 hardware ACL\)](#)

Command changes Version 5.5.4-2.3: ability to create multiple mirror ports added, except on x220, x320, GS980M and GS980EM Series

remote-mirror interface

Overview Use this command on the source device to specify the source port whose traffic is to be remote-mirrored (monitored), and the remote mirroring VLAN ID these mirrored frames will be tagged with when they egress from the source device. The port for which Interface Configuration mode is entered is the port via which the mirrored traffic egresses the source device towards the remote destination device.

Use the **no** variant of this command to disable remote mirroring of the specified mirrored port by the egress (destination) port on the source device.

Syntax `remote-mirror interface <port-list> direction {both|receive|transmit} vlan <2-4090> [priority <0-7>]`
`remote-mirror interface none vlan <2-4090> [priority <0-7>]`
`no remote-mirror interface <port-list> [direction {receive|transmit}]`
`no remote-mirror interface none`

Parameter	Description
<code><port-list></code>	The ports from which to mirror traffic. A port-list can be: • a port (e.g. port1.0.1) • a continuous range of ports separated by a hyphen, e.g. port1.0.1-port1.0.4 • a comma-separated list of ports and port ranges, e.g. port1.0.1,port1.0.3-port1.0.4
<code>direction</code>	Specifies whether to mirror traffic that the source port receives, transmits, or both.
<code>both</code>	Mirroring traffic both received and transmitted by the source port.
<code>receive</code>	Mirroring traffic received by the source port.
<code>transmit</code>	Mirroring traffic transmitted by the source port.
<code>2-4090</code>	The VLAN ID of the remote mirroring VLAN that this mirrored traffic is to be tagged with at the egress port on the source device.
<code>priority</code>	The 802.1p priority tag to apply to mirrored packets.

Default No ports are set to be remote mirrored by default.

Mode Interface Configuration

Usage notes To prevent unwanted processing of mirrored traffic, we recommend configuring remote monitoring on the receiving device before configuring it on the source device.

This command can only be used to configure a single egress port on the source device, not a range of egress ports. Do not use the **interface** command with multiple interfaces before using this **remote-mirror interface** command. One egress (destination) port on the source device can transmit mirrored frames from up to four remote mirrored (source) ports.

The egress port on the source device can be associated with other VLANs in addition to the remote mirror VLAN, so it can function as an uplink for traffic from multiple VLANs. This command does not change the VLAN associations of the mirrored ports.

Only one port on the device can be configured as either a mirror port for port mirroring (**mirror interface** command) or as an egress port on the source device for remote mirroring (**remote-mirror interface** command).

All mirrored ports on a single device must use the same remote mirror VLAN and priority.

Access control lists can be used to mirror a subset of traffic from the mirrored port by using the copy-to-mirror parameter in hardware ACL commands.

Example To configure the source device to send all the traffic that it receives on remote-mirrored port port1.0.2 out egress port port1.0.1 tagged with remote mirroring VLAN ID 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# remote-mirror interface port1.0.2 direction
receive vlan 2
```

To stop port1.0.1 remote-mirroring traffic received on mirrored port port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no remote-mirror interface port1.0.2
direction receive
```

Related commands

- access-list (numbered hardware ACL for IP packets)**
- access-list (numbered hardware ACL for MAC addresses)**
- default-action**
- mirror interface**
- remote-mirror interface**
- show remote-mirror**
- switchport remote-mirror-egress**
- vlan mode remote-mirror-vlan**

show mirror

Overview Use this command to display the status of all mirrored ports.

Syntax show mirror

Mode User Exec and Privileged Exec

Example To display the status of all mirrored ports, use the following command:

```
awplus# show mirror
```

Output The following shows typical output.

Example output from the show mirror command

```
Mirror Test Port Name: port1.0.1  
Mirror option: Enabled  
Mirror direction: both  
Monitored Port Name: port1.0.2
```

show mirror interface

Overview Use this command to display port mirroring configuration for a mirrored (monitored) switch port.

Syntax show mirror interface *<port>*

Parameter	Description
<i><port></i>	The monitored switch port to display information about.

Mode User Exec, Privileged Exec and Interface Configuration

Example To display port mirroring configuration for port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# show mirror interface port1.0.2
```

Output The following shows typical output.

Example output from the show mirror interface command

```
Mirror Test Port Name: port1.0.1
Mirror option: Enabled
Mirror direction: both
Monitored Port Name: port1.0.2
```

show remote-mirror

Overview Use this command to display information for remote-mirroring.

Syntax show remote-mirror

Mode User Exec

Example To display information about remote mirroring, use the command:

```
awplus# show remote-mirror
```

Output The following shows typical output.

Example output from show remote-mirror

```
awplus#show remote-mirror
Remote mirror information:
Remote mirror destination:
  Port: port1.0.3
  VLAN: 259
  User priority: 0

Monitored ports:
  port1.0.1
  direction: both

Remote mirror egress ports:

Remote mirror VLANs:
  VLAN 259
```

Parameters in the output from show remote-mirror

Parameter	Description
Remote mirror destination	On the source device, this displays information about: - the egress port for the mirrored traffic on the source device - the remote mirroring VLAN ID this traffic is tagged with on egress - the user priority this traffic is tagged with on egress
Monitored ports	On the source device, this displays: - the ports being mirrored (monitored) - the direction—whether both received traffic, transmitted traffic or both are mirrored 'none (via ACL)' if it is configured with the command remote-mirror interface none to allow ACLs to select the traffic to be mirrored
Remote mirror egress ports	On the destination device, this displays : - the remote mirror egress ports - the remote mirror VLANs they are associated with
Remote mirror VLANs	On source, destination and intermediate devices, this displays a list of any VLANs configured in remote mirror VLAN mode. To see a list of the ports associated with these VLANs, use the command show vlan brief .

Related commands [remote-mirror interface](#)
[switchport remote-mirror-egress](#)
[vlan mode remote-mirror-vlan](#)

switchport remote-mirror-egress

Overview Use this command on the device receiving remote mirrored traffic to set the remote mirroring egress port for the specified remote mirroring VLAN. This port removes the remote mirror VLAN tagging before transmitting the mirrored traffic. Ingress traffic on this port is disabled.

Use the **no** variant of this command to reset the port to no longer function as a remote mirror egress port.

Syntax switchport remote-mirror-egress vlan <vlan-id>
no switchport remote-mirror-egress

Parameter	Description
<vlan-id>	The port will transmit the mirrored traffic it receives from this remote mirror VLAN.

Default There is no remote mirror egress port by default.

Mode Interface Configuration for a switch port

Usage notes To prevent unwanted processing of mirrored traffic, we recommend configuring remote monitoring on the receiving device before configuring it on the source device.

This command would typically be used for the port that transmits the remote-mirrored traffic to a device that will analyze it. The port effectively functions as an access port in the remote mirror VLAN, with the added feature of not allowing ingress traffic on the port.

Example To set port1.0.2 on the destination device as the remote mirror egress port for mirrored traffic that is tagged with VLAN ID 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport remote-mirror-egress vlan 2
```

To unset port1.0.2 as a remote mirror egress port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport remote-mirror-egress
```

Related commands [remote-mirror interface](#)
[show remote-mirror](#)
[vlan mode remote-mirror-vlan](#)

vlan mode remote-mirror-vlan

Overview Use this command to create a single VLAN or a range of VLANs in remote mirror mode to be used for remote mirroring.

Use the **no** variant of this command to remove the remote mirror VLAN from the VLAN database and its configurations.

Syntax `vlan [<vid>|<vid-range>] mode remote-mirror-vlan`
`no vlan [<vid>|<vid-range>]`

Parameter	Description
<code><vid></code>	The VLAN ID of the remote mirroring VLAN to be created.
<code><vid-range></code>	The range of VLAN IDs for the remote mirroring VLANs to be created.

Default There is no remote mirror VLAN by default.

Mode VLAN Configuration

Usage notes This remote mirror VLAN needs to be configured on the remote mirroring source device, the destination (receiving) device, and any devices in between that are to forward the mirrored traffic. We recommend configuring this on the receiving device and intermediate devices before configuring the source device.

The remote mirror VLAN operates in a special mode— all traffic on the remote mirror VLAN is flooded, and no learning or CPU processing is done for packets in the VLAN. BPDU packets (link-local packets used to control features like spanning tree or AMF) are dropped on remote mirror VLANs.

Disabling the remote-mirroring VLAN on the source switch does not prevent the mirrored packets from being sent with the remote-mirror VLAN tag. To stop the mirroring, the command **no remote-mirror interface** must be used.

Example To create a VLAN with VLAN ID 3 in remote mirror VLAN mode, use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 3 mode remote-mirror-vlan
```

To remove the remote mirror VLAN with ID 3, use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# no vlan 3
```

Related commands [remote-mirror interface](#)
[show remote-mirror](#)
[switchport remote-mirror-egress](#)

Part 2: Interfaces and Layer 2

13

Switching Commands

- Contents**
- **Introduction** on page 538
 - **backpressure** on page 539
 - **clear loop-protection action** on page 541
 - **clear loop-protection counters** on page 542
 - **clear mac address-table dynamic** on page 543
 - **clear mac address-table static** on page 545
 - **clear port counter** on page 546
 - **clear port-security intrusion** on page 547
 - **debug loopprot** on page 550
 - **debug platform packet** on page 551
 - **duplex** on page 553
 - **flowcontrol (switch port)** on page 555
 - **linkflap action** on page 557
 - **loop-protection loop-detect** on page 558
 - **loop-protection action** on page 560
 - **loop-protection action-delay-time** on page 562
 - **loop-protection timeout** on page 563
 - **mac address-table acquire** on page 564
 - **mac address-table ageing-time** on page 565
 - **mac address-table logging** on page 566
 - **mac address-table static** on page 567
 - **mac address-table thrash-limit** on page 568
 - **platform acs-to-vlanclassifiers** on page 569
 - **platform control-plane-prioritization rate** on page 571
 - **platform jumboframe** on page 573
 - **platform l2mc-overlap** on page 574
 - **platform l2mc-table mode** on page 575
 - **platform load-balancing** on page 578
 - **platform multicast-address-mismatch-action** on page 580
 - **platform multicast-ratelimit** on page 582
 - **platform port-tx-recovery** on page 583
 - **platform routingratio** on page 584
 - **platform stop-unreg-mc-flooding** on page 586
 - **polarity** on page 588
 - **show debugging loopprot** on page 589
 - **show debugging platform packet** on page 590
 - **show flowcontrol interface** on page 591

- **show interface err-disabled** on page 592
- **show interface switchport** on page 594
- **show loop-protection** on page 595
- **show mac address-table** on page 597
- **show mac address-table thrash-limit** on page 599
- **show platform** on page 600
- **show platform classifier statistics utilization brief** on page 603
- **show platform port** on page 608
- **show port-security interface** on page 610
- **show port-security intrusion** on page 611
- **show storm-control** on page 612
- **speed** on page 613
- **storm-control level** on page 617
- **switchport block unicast-flooding** on page 619
- **switchport port-security** on page 621
- **switchport port-security aging** on page 623
- **switchport port-security maximum** on page 625
- **switchport port-security violation** on page 627
- **thrash-limiting** on page 629
- **undebg loopprot** on page 631
- **undebg platform packet** on page 632

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure switching.

For more information, see the [Switching Feature Overview and Configuration Guide](#).

backpressure

Overview This command provides a method of applying flow control to ports running in half duplex mode. The setting will only apply when the link is in the half-duplex state.

You can disable backpressure on an interface using the **off** parameter or the **no** variant of this command.

Syntax backpressure {on|off}
no backpressure

Parameters	Description
on	Enables half-duplex flow control.
off	Disables half-duplex flow control.

Default Backpressure is turned off by default. You can determine whether an interface has backpressure enabled by viewing the running-config output; **backpressure on** is shown for interfaces if this feature is enabled.

Mode Interface Configuration

Usage notes The backpressure feature enables half duplex Ethernet ports to control traffic flow during congestion by preventing further packets arriving. Backpressure utilizes a pre-802.3x mechanism in order to apply Ethernet flow control to switch ports that are configured in the half duplex mode.

The flow control applied by the **flowcontrol (switch port)** operates only on full-duplex links, whereas backpressure operates only on half-duplex links.

If a port has insufficient capacity to receive further frames, the device will simulate a collision by transmitting a CSMACD jamming signal from this port until the buffer empties. The jamming signal causes the sending device to stop transmitting and wait a random period of time, before retransmitting its data, thus providing time for the buffer to clear. Although this command is only valid for switch ports operating in half-duplex mode the remote device (the one sending the data) can be operating in the full duplex mode.

To see the currently-negotiated duplex mode for ports whose links are up, use the command **show interface**. To see the configured duplex mode (when different from the default), use the command **show running-config**.

Examples To enable backpressure flow control on port1.0.2, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# backpressure on
```

To disable backpressure flow control on interface port1.0.2, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# backpressure off
```

Related commands [duplex](#)
[show interface](#)
[show running-config](#)

clear loop-protection action

Overview Use this command to clear the loop protection actions on the specified interfaces.

Syntax `clear loop-protection [interface <port-list>] action`

Parameters	Description
interface	The interface whose actions are to be cleared.
<port-list>	A port, a port range, or an aggregated link.

Mode Privileged Exec

Example To clear the loop protection actions on interface port1.0.2, use the command:

```
awplus# clear loop-protection interface port1.0.2 action
```

To clear the loop protection actions of all interfaces on a device, use the command:

```
awplus# clear loop-protection action
```

Related commands [loop-protection loop-detect](#)
[loop-protection action](#)
[show loop-protection](#)

clear loop-protection counters

Overview Use this command to clear the loop protection counters.

Syntax clear loop-protection [interface *<port-list>*] counters

Parameters	Description
interface	The interface whose counters are to be cleared.
<i><port-list></i>	A port, a port range, or an aggregated link.

Mode Privileged Exec

Examples To clear the counter information for all interfaces:

```
awplus# clear loop-protection counters
```

To clear the counter information for a single port:

```
awplus# clear loop-protection interface port1.0.1 counters
```

Related commands [show loop-protection](#)

clear mac address-table dynamic

Overview Use this command to clear the filtering database of all entries learned for a selected MAC address, an MSTP instance, a switch port interface, or a VLAN interface.

Syntax `clear mac address-table dynamic
[address <mac-address>|interface <port> [instance <inst>]]
vlan <vid>]`

Parameter	Description
address <mac-address>	Specify a MAC (Media Access Control) address to be cleared from the filtering database, in the format HHHH.HHHH.HHHH.
interface <port>	Specify a switch port to be cleared from the filtering database. The port can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2)
instance <inst>	Specify an MSTP (Multiple Spanning Tree) instance in the range 1 to 63 to be cleared from the filtering database.
vlan <vid>	Specify a VID (VLAN ID) in the range 1 to 4094 to be cleared from the filtering database.

Mode Privileged Exec

Usage notes Use this command with options to clear the filtering database of all entries learned for a given MAC address, interface or VLAN. Use this command without options to clear any learned entries.

Use the optional **instance** parameter to clear the filtering database entries associated with a specified MSTP instance. Note that you must first specify a switch port interface before you can specify an MSTP instance.

Compare this usage and operation with the [clear mac address-table static](#). Note that an MSTP instance cannot be specified with the command `clear mac address-table static`.

Examples This example shows how to clear all dynamically learned filtering database entries.

```
awplus# clear mac address-table dynamic
```

This example shows how to clear all dynamically learned filtering database entries when learned through device operation for the MAC address 0000.5E00.5302.

```
awplus# clear mac address-table dynamic address 0000.5E00.5302
```

This example shows how to clear all dynamically learned filtering database entries when learned through device operation for a given MSTP instance 1 on switch port interface port1.0.3.

```
awplus# clear mac address-table dynamic interface port1.0.3  
instance 1
```

Related commands [clear mac address-table static](#)
[show mac address-table](#)

clear mac address-table static

Overview Use this command to clear the filtering database of all statically configured entries for a selected MAC address, interface, or VLAN.

Syntax `clear mac address-table static [address <mac-address>|
interface <port>|vlan <vid>]`

Parameter	Description
address <mac-address>	Specify a MAC (Media Access Control) address to be cleared from the filtering database, in the format HHHH.HHHH.HHHH.
interface <port>	Specify the port from which statically configured entries are to be cleared. The port can be • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2)
vlan <vid>	Specify a VID (VLAN ID) in the range 1 to 4094 to be cleared from the filtering database.

Mode Privileged Exec

Usage notes Use this command with options to clear the filtering database of all entries made from the CLI for a given MAC address, interface or VLAN. Use this command without options to clear any entries made from the CLI.

Compare this usage with [clear mac address-table dynamic](#).

Examples This example shows how to clear all filtering database entries configured through the CLI.

```
awplus# clear mac address-table static
```

This example shows how to clear all filtering database entries for a specific interface configured through the CLI.

```
awplus# clear mac address-table static interface port1.0.3
```

This example shows how to clear filtering database entries configured through the CLI for the MAC address 0000.5E00.5302.

```
awplus# clear mac address-table static address 0000.5E00.5302
```

Related commands [clear mac address-table dynamic](#)
[mac address-table static](#)
[show mac address-table](#)

clear port counter

Overview Use this command to clear the packet counters of the port.

Syntax clear port counter [*<port>*]

Parameter	Description
<i><port></i>	The port number or range

Mode Privileged Exec

Example To clear the packet counter for port1.0.1, use the command:

```
awplus# clear port counter port1.0.1
```

Related commands [show platform port](#)

clear port-security intrusion

Overview Use this command to clear the history of the port-security intrusion list on all ports and LAGs, or an individual port or LAG. If you do not specify a port or LAG, this command clears the intrusion lists of all ports and LAGs.

This command does not clear any MAC addresses the switch has already learned. If you want to clear already-learned MAC addresses from the filtering database, use the **clear mac address-table dynamic** command or the **clear mac address-table static** command.

Syntax clear port-security intrusion [interface <port>]

Parameter	Description
<port>	Specify the switch port or LAG from which the history of violated address entries will be cleared. This can be a single switch port, (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Examples To see the intrusion list on port1.0.2, use the following command:

```
awplus# show port-security intrusion interface port1.0.2
```

Example output from show port-security intrusion

```
awplus#show port-security intrusion interface port1.0.2
Port Security Intrusion List
-----
Interface: port1.0.2      - 1 intrusion(s) detected
801f.0200.19da
```

To clear the history of port-security intrusion list on port1.0.2, use the following command:

```
awplus# clear port-security intrusion interface port1.0.2
```

To see the port-security status on port1.0.2, use the following command:

```
awplus# show port-security interface port1.0.2
```

Example output from show port-security interface

```
awplus#show port-security interface port1.0.2
Port Security configuration
-----
Security Enabled : YES
Port Status : ENABLED
Violation Mode : TRAP
Aging : OFF
Maximum MAC Addresses : 1
Total MAC Addresses : 1
Lock Status : LOCKED
Security Violation Count : 0
Last Violation Source Address : None
```

NOTE: Note that the port status is still locked while the history of port violation is cleared from the database.

To re-check the intrusion list on port1.0.2, use the following command:

```
awplus# show port-security intrusion interface port1.0.2
```

Example output from show port-security intrusion

```
awplus#show port-security intrusion interface port1.0.2
Port Security Intrusion List
-----
Interface: port1.0.2      - no intrusions detected
```


Related commands **show port-security interface**
show port-security intrusion
switchport port-security
switchport port-security aging
switchport port-security maximum
switchport port-security violation

Command changes Version 5.5.1-0.1: port-security on LAGs added for SBx81CFC960, SBx908 GEN2, x950, x930, x550, x530, x530L, x320, x230, x230L and x220 Series switches

debug loopprot

Overview This command enables Loop Protection debugging.

The **no** variant of this command disables Loop Protection debugging.

Syntax debug loopprot {info|msg|pkt|state|nsm|all}
no debug loopprot {info|msg|pkt|state|nsm|all}

Parameter	Description
info	General Loop Protection information.
msg	Received and transmitted Loop Detection Frames (LDFs).
pkt	Echo raw ASCII display of received and transmitted LDF packets to the console.
state	Loop Protection states transitions.
nsm	Network Service Module information.
all	All debugging information.

Mode Privileged Exec and Global Configuration

Example To enable debug for all state transitions, use the command:

```
awplus# debug loopprot state
```

Related commands [show debugging loopprot](#)
[undebug loopprot](#)

debug platform packet

Overview This command enables platform to CPU level packet debug functionality on the device.

Use the **no** variant of this command to disable platform to CPU level packet debug. If the result means both send and receive packet debug are disabled, then any active timeout will be canceled.

Syntax debug platform packet [recv] [send] [sflow] [timeout <timeout>]
[vlan <vid>|all]
no debug platform packet [recv] [send]

Parameter	Description
recv	Debug packets received.
send	Debug packets sent.
sflow	Debug sFlow packets.
timeout <timeout>	Stop debug after a specified time. Specify the time in seconds.
vlan <vid>	Specify a VID (VLAN ID) in the range 1 to 4094 to limit debug to that VLAN.
all	Debug all VLANs (default setting).

Default A 5 minute timeout is configured by default if no other timeout duration is specified.

Mode Privileged Exec and Global Configuration

Usage notes This command can be used to trace packets sent and received by the CPU. If a timeout is not specified, then a default 5 minute timeout will be applied.

If a timeout of 0 is specified, packet debug will be generated until the **no** variant of this command is used or another timeout value is specified. The timeout value applies to both send and receive debug and is updated whenever the **debug platform packet** command is used.

Examples To enable both receive and send packet debug for the default timeout of 5 minutes, enter:

```
awplus# debug platform packet
```

To enable receive packet debug for 10 seconds, enter:

```
awplus# debug platform packet recv timeout 10
```

To enable packet debug for sFlow packets only for the default timeout of 5 minutes, enter:

```
awplus# debug platform packet sflow
```

To enable send packet debug with no timeout, enter:

```
awplus# debug platform packet send timeout 0
```

To enable VLAN packet debug for VLAN 1 with a timeout duration of 3 minutes, enter:

```
awplus# debug platform packet vlan 1 timeout 180
```

To disable receive packet debug, enter:

```
awplus# no debug platform packet recv
```

Related commands [show debugging platform packet](#)
[undebug platform packet](#)

duplex

Overview This command changes the duplex mode for the specified port.

To see the currently-negotiated duplex mode for ports whose links are up, use the command **show interface**. To see the configured duplex mode (when different from the default), use the command **show running-config**.

Syntax duplex {auto|full|half}

Parameter	Description
auto	Auto-negotiate duplex mode.
full	Operate in full duplex mode only.
half	Operate in half duplex mode only.

Default By default, ports auto-negotiate duplex mode (except for 100Base-FX ports which do not support auto-negotiation, so default to full duplex mode).

Mode Interface Configuration

Usage notes Switch ports in a static or dynamic (LACP) channel group must have the same port speed and be in full duplex mode. Once switch ports have been aggregated into a channel group, you can set the duplex mode of all the switch ports in the channel group by applying this command to the channel group.

Examples To specify full duplex for port1.0.4, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# duplex full
```

To specify half duplex for port1.0.4, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# duplex half
```

To auto-negotiate duplex mode for port1.0.4, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# duplex auto
```

Related **polarity**
commands **speed**
show interface

flowcontrol (switch port)

Overview Use this command to enable flow control, and configure the flow control mode for the switch port.

Use the **no** variant of this command to disable flow control for the specified switch port.

Syntax flowcontrol both
flowcontrol {receive|send} {off|on}
no flowcontrol

Parameter	Description
both	Use this parameter to specify send and receive flow control for the port.
receive	When the port receives pause frames, it temporarily stops (pauses) sending traffic.
send	When the port is congested (receiving too much traffic), it sends pause frames to request the other end to temporarily stop (pause) sending traffic.
on	Enable the specified flow control.
off	Disable the specified flow control.

Default By default, flow control is disabled.

Mode Interface Configuration

Usage notes The flow control mechanism specified by 802.3x is only for full duplex links. It operates by sending PAUSE frames to the link partner to temporarily suspend transmission on the link.

Flow control enables connected Ethernet ports to control traffic rates during congestion by allowing congested nodes to pause link operation at the other end. If one port experiences congestion, and cannot receive any more traffic, it notifies the other port to stop sending until the condition clears. When the local device detects congestion at its end, it notifies the remote device by sending a pause frame. On receiving a pause frame, the remote device stops sending data packets, which prevents loss of data packets during the congestion period.

Flow control is not recommended when running QoS or ACLs, because the complex queuing, scheduling, and filtering configured by QoS or ACLs may be slowed by applying flow control.

For half-duplex links, an older form of flow control known as backpressure is supported. See the related **backpressure** command.

For flow control on async serial (console) ports, see the **flowcontrol hardware (asyn/console)** command.

Examples To enable flow control on port1.0.2 (receive only), use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# flowcontrol receive on
```

To enable flow control on port1.0.2 (send only), use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# flowcontrol send on
```

To disable flow control on port1.0.2 (receive only), use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# flowcontrol receive off
```

To disable flow control on port1.0.2 (send only), use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# flowcontrol send off
```

Related commands **backpressure**
show running-config

linkflap action

Overview Use this command to detect flapping on all ports. If more than 15 flaps occur in less than 15 seconds the flapping port will shut down.

Use the **no** variant of this command to disable flapping detection at this rate.

Syntax linkflap action [shutdown]
no linkflap action

Parameter	Description
linkflap	Global setting for link flapping.
action	Specify the action for port.
shutdown	Shutdown the port.

Default Linkflap action is disabled by default.

Mode Global Configuration

Example To enable the linkflap action command on the device, use the following commands:

```
awplus# configure terminal
awplus(config)# linkflap action shutdown
```

loop-protection loop-detect

Overview Use this command to enable the loop-protection loop-detect feature and configure its parameters.

Use the **no** variant of this command to disable the loop-protection loop-detect feature.

Syntax `loop-protection loop-detect [ldf-interval <period>] [ldf-rx-window <frames>] [fast-block]`
`no loop-protection loop-detect`

Parameter	Description
<code>ldf-interval</code>	The time (in seconds) between successive loop-detect frames being sent.
<code><period></code>	Specify a period between 1 and 600 seconds. The default is 10 seconds.
<code>ldf-rx-window</code>	The number of transmitted loop detect frames whose details are held for comparing with frames arriving at the same port.
<code><frames></code>	Specify a value for the window size between 1 and 5 frames. The default is 3 frames.
<code>fast-block</code>	The fast-block blocks transmitting port to keep partial connectivity.

Default The loop-protection loop-detect feature is disabled by default. The default interval is 10 seconds, and the default window size is 3 frames.

Mode Global Configuration

Usage notes If transmitting of loop-detection frames takes too long, then it can time out and the switch may not send all loop-detection frames, and therefore may not detect a loop. This can happen in some networks with large numbers of loop-protection instances with short loop-detection intervals. In this case, the switch generates a log message:

“Sending loop-detection frames taking longer than expected - too many instances?”

To prevent this log message, you can either:

- change the loop-detection frame interval to a higher value to reduce the number of packets that are sent in each block. To do this, use the command **loop-protection loop-detect ldf-interval <period>**, or
- reduce the number of instances by reducing the number of VLANs per port or by removing loop protection from some ports.

The **show loop-protection** command shows the total number of loop-protection instances (one instance per VLAN per port) and the number of packets that need to be transmitted by the device each second (the Total Instances entry). It also shows the number of packets that timed out for each port (the Timeout entry). The **show loop-protection counter** command shows the number of timeouts per VLAN for each port.

See the “Loop Protection” section in the **Switching Feature Overview and Configuration Guide** for more relevant conceptual, configuration, and overview information before applying this command.

Example To enable the loop-detect mechanism on the switch, and generate loop-detect frames once every 5 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# loop-protection loop-detect ldf-interval 5
```

Related commands **loop-protection action**
loop-protection timeout
show loop-protection

loop-protection action

Overview Use this command to specify the protective action to apply when a network loop is detected on an interface.

Use the **no** variant of this command to reset the loop protection actions to the default action, vlan-disable, on an interface.

Syntax loop-protection action {link-down|log-only|port-disable|vlan-disable|none}
no loop-protection action

Parameter	Description
link-down	Block all traffic on a port (or aggregated link) that detected the loop, and take down the link.
log-only	Details of loop conditions are logged. No action is applied to the port (or aggregated link).
port-disable	Block all traffic on interface for which the loop occurred, but keep the link in the up state.
vlan-disable	Block all traffic for the VLAN on which the loop traffic was detected. Note that setting this parameter will also enable ingress filtering. This is the default action.
none	Applies no protective action.

Default loop-protection action vlan-disable

Mode Interface Configuration

Usage notes See the “Loop Protection” section in the [Switching Feature Overview and Configuration Guide](#) for relevant conceptual, configuration, and overview information prior to applying this command.

Example To disable the interface port1.0.2 and bring the link down when a network loop is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# loop-protection action link-down
```

Related commands **loop-protection loop-detect**
loop-protection timeout
show loop-protection

loop-protection action-delay-time

Overview Use this command to sets the loop protection action delay time for an interface to specified values in seconds. The action delay time specifies the waiting period for the action.

Use the **no** variant of this command to reset the loop protection action delay time for an interface to default.

Syntax loop-protection action-delay-time <0-86400>
no loop-protection action

Parameter	Description
<0-86400>	Time in seconds; 0 means action delay timer is disabled.

Default Action delay timer is disabled by default.

Mode Interface Configuration

Example To configure a loop protection action delay time of 10 seconds on port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# loop-protection action-delay-time 10
```

Related commands [loop-protection loop-detect](#)
[loop-protection timeout](#)
[show loop-protection](#)

loop-protection timeout

Overview Use this command to specify the Loop Protection recovery action duration on an interface.

Use the **no** variant of this command to set the loop protection timeout to the default.

Syntax loop-protection timeout *<duration>*
no loop-protection timeout

Parameter	Description
<i><duration></i>	The time (in seconds) for which the configured action will apply before being disabled. This duration can be set between 0 and 86400 seconds (24 hours). The set of 0 means infinity so timeout does not expire.

Default The default is 7 seconds.

Mode Interface Configuration

Usage notes See the “Loop Protection” section in the [Switching_Feature Overview_and Configuration_Guide](#) for relevant conceptual, configuration, and overview information prior to applying this command.

Example To configure a loop protection action timeout of 10 seconds for port1.0.4, use the command:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# loop-protection timeout 10
```

Related commands [loop-protection loop-detect](#)
[loop-protection action](#)
[show loop-protection](#)

mac address-table acquire

Overview Use this command to enable MAC address learning on the device.
Use the **no** variant of this command to disable learning.

Syntax `mac address-table acquire`
`no mac address-table acquire`

Default Learning is enabled by default for all instances.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# mac address-table acquire`

mac address-table ageing-time

Overview Use this command to specify an ageing-out time for a learned MAC address. The learned MAC address will persist for at least the specified time.

The **no** variant of this command will reset the ageing-out time back to the default of 300 seconds (5 minutes).

Syntax `mac address-table ageing-time <ageing-timer> none`
`no mac address-table ageing-time`

Parameter	Description
<code><ageing-timer></code>	<code><10-1000000></code> The number of seconds of persistence.
<code>none</code>	Disable learned MAC address timeout.

Default The default ageing time is 300 seconds.

Mode Global Configuration

Examples The following commands specify various ageing timeouts on the device:

```
awplus# configure terminal
awplus(config)# mac address-table ageing-time 1000
awplus# configure terminal
awplus(config)# mac address-table ageing-time none
awplus# configure terminal
awplus(config)# no mac address-table ageing-time
```

mac address-table logging

Overview Use this command to create log entries when the content of the FDB (forwarding database) changes. Log messages are produced when a MAC address is added to or removed from the FDB.



CAUTION: MAC address table logging may impact the performance of the switch. Only enable it when necessary as a debug tool.

Use the **no** variant of this command to stop creating log entries when the content of the FDB changes.

Syntax mac address-table logging
no mac address-table logging

Default MAC address table logging is disabled by default.

Mode User Exec/Privileged Exec

Usage When MAC address table logging is enabled, the switch produces the following messages:

Change	Message format	Example
MAC added	MAC add <mac> <port> <vlan>	MAC add eccd.6db5.68a7 port1.0.1 vlan2
MAC deleted	MAC delete <mac> <port> <vlan>	MAC delete eccd.6db5.68a7 port1.0.1 vlan2
MAC aged out	MAC age-out <mac> <port> <vlan>	MAC age-out eccd.6db5.68a7 port1.0.1 vlan2

To see whether MAC address table logging is enabled, use the command **show running-config**.

Example To create log messages when the content of the FDB changes, use the command:

```
awplus# mac address-table logging
```

Related commands **show running-config**

mac address-table static

Overview Use this command to statically configure the MAC address-table to do one of the following:

- forward frames with a matching destination MAC address
- discard frames with a matching destination MAC address

Syntax `mac address-table static <mac-addr> {forward|discard} interface <port> [vlan <vid>]`
`no mac address-table static <mac-addr> {forward|discard} interface <port> [vlan <vid>]`

Parameter	Description
<mac-addr>	The destination MAC address in HHHH.HHHH.HHHH format.
forward	Forward frames when the destination MAC address matches.
discard	Drop frames when the destination MAC address matches.
interface <port>	Specify a port. The port can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2)
vlan <vid>	The ID of a VLAN to apply the command to, in the range 1 to 4094. If you do not specify a VLAN, the command applies to VLAN1.

Mode Global Configuration

Usage notes The **mac address-table static** command is only applicable to Layer 2 switched traffic within a single VLAN. Do not apply the **mac address-table static** command to Layer 3 switched traffic passing from one VLAN to another VLAN. Frames will not be discarded across VLANs because packets are routed across VLANs. This command only works on Layer 2 traffic.

Example To forward traffic that belongs to VLAN 3 and has a destination MAC address of 2222.2222.2222, on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# mac address-table static 2222.2222.2222 forward
interface port1.0.1 vlan 3
```

Related commands [clear mac address-table static](#)
[show mac address-table](#)

mac address-table thrash-limit

Overview Use this command to set the thrash limit on the device.

Thrashing occurs when a MAC address table rapidly “flips” its mapping of a single MAC address between two switchports on the same VLAN. This is usually because of a network loop.

Use the **no** variant of this command to return the thrash limit to its default setting.

Syntax `mac address-table thrash-limit <rate>`
`no mac address-table thrash-limit`

Parameter	Description
<code><rate></code>	The maximum thrash rate at which limiting is applied. This rate can be set to between 5 and 255 MAC thrashing flips per second. Once the thrash limit rate is reached, the port is considered to be thrashing.

Default 10 MAC thrashing flips per second

Mode Global Configuration

Usage notes Use this command to limit thrashing on the selected port range.

Example To apply a thrash limit of 20 MAC address flips per second:

```
awplus# configure terminal
awplus(config)# mac address-table thrash-limit 20
```

Related commands [show interface](#)
[show mac address-table thrash-limit](#)
[thrash-limiting](#)

platform acls-to-vlanclassifiers

Overview Use this command to configure the amount of memory allocated (or split) between ACLs and VLAN classifiers.

Use the **no** variant of this command to reset the allocation to the default setting.

Syntax `platform acls-to-vlanclassifiers {more-vlan-classifiers | half-and-half | more-acls}`

`no platform acls-to-vlanclassifiers`

Parameter	Description
more-vlan-classifiers	Support more dynamic VLAN classifiers.
half-and-half	Support the same number of ACLs and VLAN classifiers.
more-acls	Support more ACLs.

Default More dynamic VLAN classifiers

Mode Global Configuration

Usage notes Access-lists and VLAN classifiers use the same memory/table in hardware. This command is used to split this memory to support more ACLs, more VLAN classifiers or the same number of ACLs and VLAN classifiers.

Note: For this command to take effect, you must copy it to the startup configuration using the **copy running-config startup-config** command and then reboot the switch.

Example To store more dynamic VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-vlan-
classifiers
```

To store the same number of ACLs and VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers half-and-half
```

To store more ACLs, use the following commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-acls
```

To reset the allocation to the default settings, use the commands:

```
awplus# configure terminal
awplus(config)# no platform acls-to-vlanclassifiers
```

Related commands

- show platform**
- show platform classifier statistics utilization brief**
- show running-config**
- show startup-config**

Command changes

- Version 5.4.9-0.1: command added
- Version 5.5.0-0.1: **tunnel-support** parameter added for x530 series

platform control-plane-prioritization rate

Overview The feature ensures that different traffic types can share the CPU effectively.

Use this command to set the maximum traffic rate on the CPU port to limit the data rate to the CPU. This is to prevent the CPU becoming overloaded with unnecessary data packets, which in turn could result in poor performance in situations such as a CLI console lock up, or control packet loss following a broadcast storm.

Use the **no** variant of this command to restore the rate limiting on the CPU port to the default.

Note that only integer values are accepted for rate limits.

Set the rate to 0 using **platform control-plane prioritization rate** to disable CPU protection.

Syntax platform control-plane-prioritization rate *<rate-limit>*
no platform control-plane-prioritization rate

Parameter	Description
<i><rate-limit></i>	<1000-1000000> 1000Kbps to 1000000Kbps (1 Mbps to 1000Mbps).

Default 1000 Mbps

Mode Global Configuration

Usage notes **Confirming default settings:**

Use **show platform** to confirm the default rate limit settings displayed with platform information:

```
awplus# show platform
```

Disabling CPU protection:

To disable the CPU protection feature you can set the control plane prioritization rate to 0:

```
awplus# platform control-plane-prioritization 0
```

Then you can confirm the CPU protection feature has been disabled using **show platform**:

```
awplus# show platform
```

Load Balancing	srt-dst-mac, src-dst-ip
Control-plane-prioritization	Max 0 Mbps
Jumboframe support	off
Enhanced mode	qos counters
Vlan-stacking TPID	0x8100

Examples To set the maximum traffic rate on the CPU port to 20 Mbps enter the following command:

```
awplus# configure terminal
```

```
awplus(config)# platform control-plane-prioritization 20000
```

Confirm the maximum traffic rate has been configured using the following **show** command:

awplus#show platform	
Load Balancing	srt-dst-mac, src-dst-ip
Control-plane-prioritization	Max 20 Mbps
Jumboframe support	off
Enhanced mode	qos counters
Vlan-stacking TPID	0x8100

To reset the maximum traffic rate on the CPU port to the default enter the following command:

```
awplus# configure terminal
```

```
awplus(config)# no platform control-plane-prioritization
```

Related commands **show platform**
show running-config

platform jumboframe

Overview This command enables the device to forward jumbo frames. See the [Switching Feature Overview and Configuration Guide](#) for more information.

When jumbo frame support is enabled, the maximum size of packets that the device can forward is 10218 bytes of payload.

Use the **no** variant of this command to remove jumbo frame support. This stops the ports from forwarding packets larger than VLAN tagged frames (1522 bytes).

NOTE: The number above specifies the payload only. For an IEEE 802.1q frame, provision is made (internally) for the following additional components:

- Source and Destination addresses
- EtherType field
- Priority and VLAN tag fields
- FCS

These additional components increase the frame size (to 1522 bytes in the default case).

Syntax platform jumboframe
no platform jumboframe

Default By default, jumbo frames is off.

Mode Global Configuration

Usage notes You must save the configuration and restart the device after entering this command for it to take effect. You can use the [reboot](#) command to restart the device.

Example To enable the device to forward jumbo frames, use the following commands:

```
awplus# configure terminal
awplus(config)# platform jumboframe
```

Related commands [show platform](#)
[show running-config](#)

platform l2mc-overlap

Overview Use this command to enable checking for overlapping (shared) multicast entries, so that shared entries are not deleted if they are still in use.

An overlap exists if the resulting MAC address is the same for two different multicast groups. For example, 224.1.1.1 and 239.1.1.1 will result in a multicast overlap—packets destined for 239.1.1.1 will also be sent to 224.1.1.1.

Use the **no** version of this command to disable checking for overlapping entries before deletion.

Syntax platform l2mc-overlap
no platform l2mc-overlap

Mode Global Configuration

Default Enabled

Usage notes When overlap handling is on, group entries will not be deleted if a multicast overlap exists. However, this may have the unexpected behavior of flooding multicast packets to ports which have not joined the group. If this is an issue, either turn off the command or redesign the network to ensure no multicast groups overlap.

Example To prevent the deletion of overlapping (shared) Layer 2 multicast entries, use the command:

```
awplus# configure terminal
awplus(config)# platform l2mc-overlap
```

Related commands [show platform](#)

Command changes Version 5.5.1-0.1: Default changed to enabled

Version 5.5.1-1.2: Command added to SBx908 GEN2 and x950 Series. Note that it is disabled by default on these switches.

platform l2mc-table mode

Overview Use this command to control the way in which hardware Layer 2 multicast forwarding entries are allocated to multicast groups. You can choose either to share entries between groups when possible, or to allocate one entry per multicast group. Sharing entries minimizes how many hardware entries are used for Layer 2 multicast forwarding.

Use the **no** variant of this command to return to the default, which is **compact**.

Syntax platform l2mc-table mode {compact|entry-per-group}
no platform l2mc-table mode

Parameter	Description
compact	Share hardware entries across similar groups
entry-per-group	Allocate a distinct entry to each group

Default Compact

Mode Global Configuration

Usage notes This command controls the way in which hardware Layer 2 multicast forwarding entries are allocated to multicast groups. These hardware entries represent a set of ports in a VLAN, to which a multicast group is being sent. More than one multicast group may be sent to the same set of egress ports in a given VLAN at the same time. If this is the case, then the default behavior is to create just the one hardware forwarding entry representing that set of egress ports on that VLAN, and have multiple multicast groups share that one entry.

The entry-per-group option changes this behavior, so that each multicast group has its own hardware entry representing the egress ports to which it is being forwarded on a given VLAN. With this option, if multiple groups are being forwarded to the same set of ports on a particular VLAN, each group will have its own hardware entry, each comprising that same set of ports.

The default mode (compact) is usually well suited to a core switch, which is forwarding many groups to a relatively few ports, and not often changing which groups are sent to which ports. Because the usage of hardware entries is minimized, this maximizes the number of multicast groups that the switch can forward. However, sometimes the entry-per-group mode is preferable, especially in the following situations:

- If multicast data is being forwarded out through an aggregated link.

The hardware forwarding entries do not allocate data to aggregated links as such; they just work with sets of individual ports, and cannot include aggregations in their set of egress ports. If groups are being forwarded to an aggregated link, a given forwarding entry will include just one port of that aggregation. If multiple multicast groups share the same forwarding entry, they will all be sent down the same single link in the aggregation. The multicast data will not be shared across the aggregated links, and therefore the bandwidth of the aggregation will not be fully utilized.

If you change the mode to entry-per-group, then each group will have its own forwarding entry, and a statistical process will put different members of the aggregation into different forwarding entries. Therefore, the multicast data will be statistically distributed across the links in the aggregation.

- If the switch is forwarding a large number of groups to a large number of ports in a dynamic environment, where end hosts are frequently joining and leaving groups.

In compact mode, every time a group membership changes, the switch needs to check to see if the mapping of groups to forwarding entries is still optimized. If not, then it needs to rearrange the mapping, to return to an optimized state. In a highly dynamic environment, this activity adds significant processing overhead, and can lead to some disruption of multicast forwarding if hardware entries are being frequently updated. In this case, changing to entry-per-group mode removes the need to perform frequent re-optimizations, thereby reducing processing overhead, and avoiding such frequent updating of hardware entries.

Example To change to entry-per-group mode, use the commands:

```
awplus# configure terminal
awplus(config)# platform l2mc-table mode entry-per-group
```

platform load-balancing

Overview This command determines which address fields are used as inputs into the load balancing algorithm for aggregated links. The output from this algorithm is used to select which individual path a given packet will traverse within an aggregated link.

The **no** variant of this command removes the specified packet type from the calculation.

Syntax `platform load-balancing [src-dst-mac] [src-dst-ip] [src-dst-port]`
`no platform load-balancing [src-dst-mac] [src-dst-ip] [src-dst-port]`

Parameter	Description
src-dst-mac	The source and destination MAC addresses (Layer 2)
src-dst-ip	The source and destination IP addresses (Layer 3)
src-dst-port	The source and destination TCP/UDP port data (Layer 4). If you include this option, make sure that src-dst-ip is also selected.

Default Includes the **src-dst-mac** and **src-dst-ip** addresses as inputs into the platform load balancing algorithm.

Mode Global configuration

Usage notes Useful combinations of inputs are:

- MAC address and IP address (the default)
- MAC address only
- MAC address, IP address and Layer 4 port number
- IP address and Layer 4 port number
- IP address only

The following examples show how to configure each of these combinations.

Note the following restrictions:

- you can only stop using MAC addresses (**src-dst-mac**) if you still have IP addresses (**src-dst-ip**) selected
- if you specify Layer 4 ports (**src-dst-port**), you should also specify IP addresses (**src-dst-ip**)

Use the **show platform** command to verify this command's setting.

Examples To use MAC addresses and IP addresses, you do not have to enter any commands, because this is the default. Note that this setting is not displayed in the **show running-config** output. Use the **show platform** command to verify this setting.

To use MAC addresses only, remove IP addresses by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-ip
```

To use MAC addresses, IP addresses and Layer 4 port numbers, add Layer 4 port numbers by using the commands:

```
awplus# configure terminal
awplus(config)# platform load-balancing src-dst-port
```

To use IP addresses and Layer 4 port numbers, remove MAC addresses and add Layer 4 port numbers by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
awplus(config)# platform load-balancing src-dst-port
```

To use IP addresses only, remove MAC addresses by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
```

Related commands **show platform**

platform multicast-address-mismatch-action

Overview Use this command to change the action taken by the switch when it receives IP multicast packets that have mismatched destination MAC address and destination IP address. Such packets are used by services like Microsoft Network Load Balancing (MS-NLB), in which case they need to be flooded across the switch.

Use the **no** variant of this command to return to the default action.

Syntax platform multicast-address-mismatch-action {bridge|drop}
no platform multicast-address-mismatch-action

Parameter	Description
drop	Drop IP multicast packets with mismatched destination addresses on ingress.
bridge	Flood IP multicast packets with mismatched destination addresses.

Default The default behavior depends on whether **arp-mac-disparity multicast** or **arp-mac-disparity multicast-igmp** has been configured on an interface:

- If one of these has been configured, then the default action is to flood the packets.
- If neither of these has been configured, then the default action is to drop the packets.

Mode Global Configuration

Usage notes You must also turn on L3 multicast, using the **ip multicast-routing** command. Otherwise, L2 flooding will occur, because no L3 processing is being done.

Example To ensure that the switch floods packets it receives that have IP multicast packets with mismatched L2/L3 destination addresses, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast-routing
awplus(config)# platform multicast-address-mismatch-action
bridge
```

To return to the default, where the behavior depends on the **arp-mac-disparity** command setting, use the commands:

```
awplus# configure terminal
awplus(config)# no platform multicast-address-mismatch-action
```

Related commands **arp**
arp-mac-disparity
ip multicast-routing

Command changes Version 5.4.8-2.1: command added

platform multicast-ratelimit

Overview Use this command to set the maximum number of multicast packets to be forwarded to the CPU (in packets per second). Setting the value to zero disables rate limiting.

This command should be used with care. Increasing or removing the limit could make the device less responsive under heavy multicast load.

Use the **no** variant of this command to return the limit to its default.

Syntax platform multicast-ratelimit <0-1000>
no platform multicast-ratelimit

Default 10 packets per second (pps)

Mode Global Configuration

Usage notes If you find that the CPU load on your device from multicast traffic is higher than desired, reducing this rate may reduce the CPU load.

If you need the device to process a large amount of multicast traffic, increasing this rate may improve performance.

Example To set the rate to 30pps, use the commands:
awplus# configure terminal
awplus(config)# platform multicast-ratelimit 30

Command changes Version 5.4.8-1.1: default changed to 100pps on SBx908 GEN2, SBx8100, and x930 Series switches.

platform port-tx-recovery

Overview Use this command to reset the port's MAC address to increase switch stability.

Use the **no** variant of this command to disable resetting a port's MAC address.

Syntax platform port-tx-recovery
no platform port-tx-recovery

Default Enabled

Mode Global Configuration

Usage notes When a switch has ports connected at half duplex, there is a chance of an instability issue occurring. In this scenario, the solution is to reset the MAC address of the port. This command is used as a recovery mechanism to reset the port's MAC address.

To see if this setting is on or off, use the **show platform** command.

Example To reset a port's MAC address, use the commands:

```
awplus# configure terminal
awplus(config)# platform port-tx-recovery
```

Related commands **show platform**

Command changes Version 5.5.2-2.1: command added

platform routingratio

Overview This command changes the amount of memory allocated to unicast and multicast entries.

Use the **no** variant of this command to restore to the default setting.

For this command or the **no** variant to take effect, you must copy it to the startup configuration and then reboot the switch.

Syntax platform routingratio ipv4andipv6 [weighting {balanced|unicast}]
no platform routingratio

Parameter	Description
ipv4andipv6	Allocate 50% of memory resources to IPv4 address entries, and 50% to IPv6 address entries.
weighting	Determine the split between multicast and unicast entries.
balanced	Allocate up to 2048 entries to multicast.
unicast	Allocate up to 1024 entries to multicast and the rest to unicast. This option is not available on SBx81XLEM cards.

Default The weighting is set to **balanced** by default.

Mode Global Configuration

Usage notes The switching hardware contains memory that it uses to store tables of routes and next hop addresses. This command adjusts the memory allocations.

The default weighting is set to **balanced**. If you need to maximize the number of unicast entries, then set the weighting to **unicast**.

Examples To apply unicast weighting for IPv4 and IPv6 addresses, use the following commands:

```
awplus# configure terminal
awplus(config)# platform routingratio ipv4andipv6 weighting
unicast
awplus(config)# exit
awplus# copy running-config startup-config
awplus# reboot
```

To reset the route and next hop tables to the default setting, use the following commands:

```
awplus# configure terminal
awplus(config)# no platform routingratio
awplus(config)# exit
awplus# copy running-config startup-config
awplus# reboot
```

Related commands [show platform](#)
[show running-config](#)

platform stop-unreg-mc-flooding

Overview If a multicast stream is arriving at a network device, and that network device has received no IGMP reports that request the receipt of the stream, then that stream is referred to as "unregistered". IGMP snooping actively prevents the flooding of unregistered streams to all ports in the VLAN on which the stream is received. However, there are brief moments at which this prevention is not in operation, and an unregistered stream may be briefly flooded. This command stops this flooding during even those brief periods when IGMP snooping is not explicitly preventing the flooding.

Use the **no** variant of this command to revert to default behavior and disable this feature.

NOTE: *This command should not be used within any IPv6 networks. IPv6 neighbor discovery operation is inhibited by this feature.*

This command does not affect the flooding of Local Network Control Block IPv4 multicast packets in the address range 224.0.0.1 to 224.0.0.255 (224.0.0/24). Such packets will continue to be uninterruptedly flooded, as they need to be.

Syntax platform stop-unreg-mc-flooding
no platform stop-unreg-mc-flooding

Default This feature is disabled by default.

Mode Global Configuration

Usage notes This command stops the periodic flooding of unknown or unregistered multicast packets when the Group Membership interval timer expires and there are no subscribers to a multicast group. If there is multicast traffic in a VLAN without subscribers, multicast traffic temporarily floods out of the VLAN when the Group Membership interval timer expires, which happens when the switch does not get replies from Group Membership queries.

This command also stops the initial flood of multicast packets that happens when a new multicast source starts to send traffic. This flooding lasts until snooping realises that this the multicast group is arriving at the switch, and puts an entry into hardware to prevent it from being flooded.

This command is useful in networks where low-performance devices are attached. The operation of such devices can be impaired by them receiving unnecessary streams of traffic. For example, in sites where IP cameras are in use, the flooding of video streams to a whole VLAN can send enough traffic to the cameras to cause interruption of their video streaming.

Do not use this command in IPv6 networks. The following console message is displayed after entering this command to warn you of this:

```
% WARNING: IPv6 will not work with this setting enabled
% Please consult the documentation for more information
```

Examples To enable this feature and stop multicast packet flooding, use the following commands:

```
awplus# configure terminal
awplus(config)# platform stop-unreg-mc-flooding
```

To disable this feature and allow multicast packet flooding, use the following commands:

```
awplus# configure terminal
awplus(config)# no platform stop-unreg-mc-flooding
```

Related commands [show platform](#)
[show running-config](#)

polarity

Overview This command sets the MDI/MDIX polarity on a copper-based switch port.

Syntax `polarity {auto|mdi|mdix}`

Parameter	Description
mdi	Sets the polarity to MDI (medium dependent interface).
mdix	Sets the polarity to MDI-X (medium dependent interface crossover).
auto	The switch port sets the polarity automatically. This is the default option.

Default By default, switch ports set the polarity automatically (**auto**).

Mode Interface Configuration

Usage notes We recommend the default **auto** setting for MDI/MDIX polarity. Polarity applies to copper 10BASE-T, 100BASE-T, and 1000BASE-T switch ports; it does not apply to fiber ports. See the “MDI/MDIX Connection Modes” section in the [Switching Feature Overview and Configuration Guide](#) for more information.

Example To set the polarity for port1.0.4 to fixed MDI mode, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# polarity mdi
```


show debugging loopprot

Overview This command shows Loop Protection debugging information.

Syntax show debugging loopprot

Mode User Exec and Privileged Exec

Example To display the enabled Loop Protection debugging modes, use the command:

```
awplus# show debugging loopprot
```

Related commands [debug loopprot](#)

show debugging platform packet

Overview This command shows platform to CPU level packet debugging information.

Syntax show debugging platform packet

Mode User Exec and Privileged Exec

Example To display the platform packet debugging information, use the command:

```
awplus# show debugging platform packet
```

Related commands [debug platform packet](#)
[undebug platform packet](#)

show flowcontrol interface

Overview Use this command to display flow control information.

Syntax show flowcontrol interface <port>

Parameter	Description
<port>	Specifies the name of the port to be displayed.

Mode User Exec and Privileged Exec

Example To display the flow control for port1.0.3, use the command:

```
awplus# show flowcontrol interface port1.0.3
```

Output The following shows typical output.

Example output from the show flowcontrol interface command for a specific interface

Port	Send admin	FlowControl oper	Receive admin	FlowControl oper	RxPause	TxPause
-----	-----	-----	-----	-----	-----	-----
port1.0.3	on	on	on	on	0	0

show interface err-disabled

Overview Use this command to show ports that have been dynamically shut down by protocols running on the device and the protocols responsible for the shutdown.

Syntax show interface [*<interface-range>*] err-disabled

Parameter	Description
<i><interface-range></i>	Interface range

Mode User Exec and Privileged Exec

Example To show which protocols have shut down ports, use the commands:

```
awplus# show interface err-disabled
```

Output The following shows typical output.

Example output from show interface err-disabled

```
awplus#show interface err-disabled
Interface      Reason
port1.0.1      loop protection
port1.0.2      loop protection
```

Parameters in the output from show interface err-disabled

Parameter	Description
Interface	The name of the interface.
Reason	The reason the interface was disabled or the feature or protocol that disabled it. One of: • A threat has been detected on the port (linkdown action from AMF Application proxy) • No installed/enabled SIM (5G has no SIM installed) • thrash limiting • loop protection • UDLD • port security • VCS disabled master • hardware health monitoring • ATMF safe mode • DHCP snooping • QoS Storm Protection • DoS Protection • Continuous Reboot Prevention • MSTP bpdu-guard • Fiber monitoring

show interface switchport

Overview Use this command to show VLAN information about each switch port.

Syntax show interface switchport

Mode User Exec and Privileged Exec

Example To display VLAN information about each switch port, enter the command:

```
awplus# show interface switchport
```

Output The following shows typical output.

Example output from the show interface switchport command

```
Interface name      : port1.0.1
Switchport mode    : access
Ingress filter      : enable
Acceptable frame types : all
Default Vlan       : 1
Configured Vlans    : 2
Translated Vlans    :
Translated Default  : accept
Dynamic Vlans      :

Interface name      : port1.0.2
Switchport mode    : trunk
Ingress filter      : enable
Acceptable frame types : all
Default Vlan       : 1
Configured Vlans    : 1 4 5 6 7 8
Translated Vlans    :
Translated Default  : accept
Dynamic Vlans      :
...
```

Related commands [show interface memory](#)
[show vlan](#)

show loop-protection

Overview Use this command to display the current configuration and operation of loop protection on the device.

Syntax `show loop-protection [interface <port-list>] [counters]`

Parameter	Description
interface	The interface selected for display.
<port-list>	A port, a port range, or an aggregated link.
counters	Displays counter information for loop protection.

Mode User Exec and Privileged Exec

Usage notes If transmitting of loop-detection frames takes too long, then it can time out and the switch may not send all loop-detection frames, and therefore may not detect a loop. This can happen in some networks with large numbers of loop-protection instances with short loop-detection intervals. In this case, the switch generates a log message:

"Sending loop-detection frames taking longer than expected - too many instances?"

To prevent this log message, you can either:

- change the loop-detection frame interval to a higher value to reduce the number of packets that are sent in each block. To do this, use the command **loop-protection loop-detect ldf-interval <period>**, or
- reduce the number of instances by reducing the number of VLANs per port or by removing loop protection from some ports.

The **show loop-protection** command shows the total number of loop-protection instances (one instance per VLAN per port) and the number of packets that need to be transmitted by the device each second (the Total Instances entry). It also shows the number of packets that timed out for each port (the Timeout entry). The **show loop-protection counter** command shows the number of timeouts per VLAN for each port.

Example To display the current configuration status, use the command:

```
awplus# show loop-protection
```

Output The following shows typical output.

Example output from the show loop-protection command:

```
awplus#show loop-protection

LDF Interval:      10
Fast Block:   Disabled
Total Instances: 29174 (2917 packets/s)

  Int           Enabled Action    Status   Timeout   Timeout   Rx port
  -----
port1.0.1      Yes     vlan-dis Normal    7         -         -
port1.0.2      Yes     vlan-dis Normal    0         -         -
port1.0.3      Yes     vlan-dis Normal    0         -         -
...
```

Example To display the counter information, use the command:

```
awplus# show loop-protection counters
```

Output The following shows typical output.

Example output from the show loop-protection counters command:

```
awplus#show loop-protection counters

Switch Loop Detection Counter

  Interface      Tx      Rx      Tx Timeout  Rx Invalid  Last LDF Rx
  -----
port1.0.1
  vlan1         60       0        7           0           -
port1.0.2
  vlan1          0       0        0           0           -
port1.0.3
  vlan1          0       0        0           0           -
...
```

Related commands [clear loop-protection counters](#)
[loop-protection action](#)
[loop-protection loop-detect](#)

show mac address-table

Overview Use this command to display the MAC address-table for all configured VLANs.

Syntax show mac address-table

Mode User Exec and Privileged Exec

Usage notes The **show mac address-table** command is only applicable to view a MAC address-table for Layer 2 switched traffic within VLANs.

Example To display the MAC address-table, use the following command:
awplus# show mac address-table

Output See the following sample output captured when there was no traffic being switched:

```
awplus#show mac address-table

VLAN port      mac                type      static
1     unknown    0000.cd28.0752    forward
ARP   -           0000.cd00.0000    forward
```

See the sample output captured when packets were switched and MAC addresses were learned:

```
awplus#show mac address-table

VLAN port      mac                type      static
1     unknown    0000.cd28.0752    forward
1     port1.0.2    0030.846e.9bf4    forward
1     port1.0.3    0030.846e.bac7    forward
ARP   -           0000.cd00.0000    forward
```

Note the new MAC addresses learned for port1.0.2 and port1.0.3 added as dynamic entries.

Note the first column of the output below shows VLAN IDs if multiple VLANs are configured:

```
awplus#show mac address-table

VLAN port      mac                type      static
1     unknown    0000.cd28.0752    forward
1     port1.0.2    0030.846e.bac7    forward
2     unknown    0000.cd28.0752    forward
2     port1.0.3    0030.846e.9bf4    forward
ARP   -           0000.cd00.0000    forward
```

Also note if manually configured static MAC addresses exist, this is shown to the right of the type column:

```
awplus(config)#mac address-table static 0000.1111.2222 for int
port1.0.3 vlan 1
awplus(config)#end
awplus#
awplus#show mac address-table

VLAN port      mac                type      static
1     unknown    0000.cd28.0752    forward
1     port1.0.2    0030.846e.bac7    forward
1     port1.0.3    0000.1111.2222    forward
...
```

Related commands [clear mac address-table dynamic](#)
[clear mac address-table static](#)
[mac address-table static](#)

show mac address-table thrash-limit

Overview Use this command to display the current thrash limit set for all interfaces on the device.

Syntax show mac address-table thrash-limit

Mode User Exec and Privileged Exec

Example To display the current, use the following command:
awplus# show mac address-table thrash-limit

Output The following shows typical output.

Example output from the show mac address-table thrash-limit command

```
% Thrash-limit 7 movements per second
```

Related commands [mac address-table thrash-limit](#)

show platform

Overview This command displays the settings configured by using the **platform** commands.

Syntax show platform

Mode Privileged Exec

Usage notes This command displays the settings in the running config. For changes in some of these settings to take effect, the device must be rebooted with the new settings in the startup config.

Example To check the settings configured with **platform** commands on the device, use the following command:

```
awplus# show platform
```

Output The following shows typical output.

Example output from the show platform command:

```
awplus# show platform
Routing ratio                IPv4 and IPv6
Route Weighting              balanced
Load Balancing               src-dst-mac,src-dst-ip
Control-plane-prioritization Max 1000 Mbps
L2MC overlapped group check off
port-tx-recovery             on
fdb-l3-hosts mode            Disabled
MC address mismatch action    Drop
Extended ACL VLAN actions     Disabled
Jumboframe support           off
Vlan-stacking TPID            0x8100
```

Parameters in the output of the show platform command.

Parameter	Description
Routing Ratio	Whether all memory is allocated to IPv4 address table entries only, or whether it is allocated evenly to both IPv4 and IPv6 addresses (set with the platform routingratio command).
Route Weighting	The split between multicast and unicast route entries (set with the platform routingratio command).
MAC vlan hashing algorithm	The MAC VLAN hash-key-generating algorithm (set with the platform mac-vlan-hashing-algorithm command). The default algorithm is crc32l. The algorithm may need to be changed in rare circumstances in which hash collisions occur.
L3 hashing algorithm	The L3 VLAN hash-key-generating algorithm (set with the platform l3-vlan-hashing-algorithm command). The default algorithm is crc32l. The algorithm may need to be changed in rare circumstances in which hash collisions occur.
Load Balancing	Which packet fields are used in the channel load balancing algorithm (set with the platform load-balancing command).
Control-plane-prioritization	Maximum traffic rate on the CPU port (set with the platform control-plane-prioritization rate command).
Fdb-chain-length	The length of the FDB hash chain (set with the platform fdb-chain-length command). FDB entries are hashed and indexed using a hash. In rare circumstances it may be useful to reduce the chain length.
L2MC overlapped group check	Whether Layer 2 multicast entries are checked before deletion (set with the platform l2mc-overlap command).
silicon-profile	The silicon profile setting (set with the platform silicon-profile command) for the switch hardware; one of: - profile 1 - profile 2

Parameter	Description
	• profile 3 • None (default)
fdb-l3-hosts mode	Whether Host Mode is turned on or not. Host Mode increases the number of host entries and is available for systems containing SBx81CFC960 controller cards and SBx81XLEM line cards. See platform silicon-profile and platform fdb-l3-hosts for details.
Jumboframe support	Whether the jumbo frames setting is enabled or disabled (set with the platform jumboframe command).
Traffic Manager	A test setting that is disabled by default.
stop-unreg-mc-flooding	Whether the stop-unreg-mc-flooding feature is on or off (set with the platform stop-unreg-mc-flooding command). This feature prevents flooding of unregistered multicast packets in the occasional situations in which IGMP snooping does not prevent it.
Port Mode	Whether each QSFP+/QSFP28 port is configured as one 40Gbps port, one 100Gbps port, or four 10Gbps ports (set with the platform portmode interface command).
Multicast operations mode	Whether multicast processing happens asynchronously or synchronously among stack members (set with the platform sync-mc-ops command).
Vlan-stacking TPID	The value of the TPID set in the Ethernet type field when a frame has a double VLAN tag (set with the platform vlan-stacking-tpid command).
PBR enabled	Whether policy-based routing is globally enabled or not (set with the platform pbr-enable command).
Hardware Filter Size	Whether hardware ACLs can filter on IPv6 addresses (ipv4-full-ipv6) or not (ipv4-limited-ipv6). This is set with the platform hwfilter-size command.
Vlan Ingress Filter Hard Drop	The Bridge Vlan Ingress Filtering drops traffic if the VID assigned to the packet does not match with the port's VLAN membership. There are two ways the traffic is dropped by the Ingress Filtering mechanism: • HARD DROP - Traffic is dropped by the Bridge Engine and not forwarded or trapped. • SOFT DROP - Traffic may be mirrored or trapped by the Bridge Engine.

Note that the parameters displayed depend on your device, and that not all displayed parameters can be modified on all devices.

show platform classifier statistics utilization brief

Overview This command displays the number of used entries available for various platform functions, and the percentage that number of entries represents of the total available.

Syntax show platform classifier statistics utilization brief

Mode Privileged Exec

Example To display the platform classifier utilization statistics, use the following command:

```
awplus# show platform classifier statistics utilization brief
```

Output The following shows typical output.

```
awplus#show platform classifier statistics utilization brief
[Instance 0]
```

```
[port1.0.1-port1.0.10]
Usage:
```

Used / Total

```
-----
System                0
MLD Snooping          0
DHCP Snooping          0
Loop Detection         0
EPSR                   0
CFM                    0
G8032                  0
Global ACL             0
ACL                    0
VACL                   0
QoS                    0
RA Guard               0
BFD                    0
AMFAPPS                0
Openflow Hybrid        0
Openflow Flow          0
Openflow Default       0
Pre-Ingress            0
```

Egress:

```
VLAN Xlate            0
VLAN Isolate           0
VLAN IsolateDef        0
Total                  0 / 1536 (0.00%)
```

```
Qos Rule Limit Reached (clear on read): 0
Total Qos Rule Limit Reached from startup: 0
```

```
Pre-Ingress Rule Limit Reached (clear on read): 0
Total Pre-Ingress Rule Limit Reached from startup: 0
```

```
Egress Rule Limit Reached (clear on read): 0
Total Egress Rule Limit Reached from startup: 0
```

UDB Usage:

Legend of Offset Type) 1:Ether 2:IP 3:TCP/UDP

```
UDB Set      Offset Type      Used / Total
----- 0-----8-----15 -----
IPv4 TCP      0000000      0 / 6
IPv4 UDP      0000000      0 / 6
MPLS          0000000      0 / 6
IPv4 Frag     0000000      0 / 6
IPv4          0000000      0 / 6
Ethernet      0000000      0 / 6
User-Def      0000000      0 / 6
IPv6 L2       0000000      0 / 6
```

Index	User	Shared	DSCP	Queue	CoS	Bandwidth-class	RefCount	StaticCnt
0	Cos 2 queue	No	0	2	0	Green	1	1
1	Cos 2 queue	No	0	0	1	Green	1	1
2	Cos 2 queue	No	0	1	2	Green	1	1
3	Cos 2 queue	No	0	3	3	Green	1	1
4	Cos 2 queue	No	0	4	4	Green	1	1
5	Cos 2 queue	No	0	5	5	Green	1	1
6	Cos 2 queue	No	0	6	6	Green	1	1

SWITCHING COMMANDS
SHOW PLATFORM CLASSIFIER STATISTICS UTILIZATION BRIEF

7	Cos 2 queue	No	0	7	7	Green	1	1
8	DSCP Premark	No	0	0	0	Green	1	1
9	DSCP Premark	No	1	0	0	Green	1	1
...								
71	DSCP Premark	No	63	0	0	Green	1	1
72	CPU Egress	Yes	0	0	0	Green	1	1
73	CPU Egress	Yes	0	1	1	Green	1	1
74	CPU Egress	Yes	0	2	2	Green	1	1
75	CPU Egress	Yes	0	3	3	Green	1	1
...								

**Output
parameters**

Depending on your switch, you will see some of the following parameters in the output from **show platform classifier statistics utilization brief**

Parameter	Description
IPv6 Multicast	Reserved hardware space for use by IPv6 multicast, when the ipv6 multicast-routing command is used.
System	Fixed system entries. For example, resiliency links make use of system ACLs.
MLD Snooping	Entries to send various packets that MLD Snooping is interested in to the CPU.
DHCP Snooping	Entries used to send DHCP and ARP packets to the CPU. User-added DHCP Snooping filters under ACLs are counted under the ACL or QoS categories.
Loop Detection	Entries uses to send the special loop detection frame to the CPU.
EPSR	Entries used to send EPSR control traffic to the CPU.
CFM	Entries used by Connectivity Fault Management.
G8032	Entries used to send G.8032 control traffic to the CPU.
Global ACLs	Entries for ACLs appear here if the ACLs are applied globally instead of per switchport.
ACL	Entries for ACL filters that have been applied directly to ports using the access-group command.
VACL	Entries for VLAN-based ACLs (ACLs that are applied to VLANs instead of ports).
DOS	Entries used for Denial of Service protection.
UFO	Entries used by Upward Forwarding Only (UFO).
QoS	Entries for ACL filters and other class-map configurations, such as policers, applied through policy maps using the service input command.
RA Guard	Entries used to block IPv6 router advertisements, configured with the ipv6 nd raguard command.
AMFAPPS	Entries used by AMF Application Proxy. These entries enable the SES Controller to block infected ports.
Pre-Ingress	Entries used for VLAN ID Translation (and also for subnet-based and MAC-based VLAN entries on SBx81XLEM cards).
Egress	Entries used for VLAN ID Translation.
UDB	User Defined Bytes (UDB), which are a limited resource of bytes that can be used to implement additional arbitrary matching on packet bytes on some switches. The software manages the use and allocation of these

Parameter	Description
	bytes automatically. The output of this table is intended for use by Allied Telesis Customer Support only.

Related commands [show platform](#)
[ipv6 access-list \(named IPv6 hardware ACL\)](#)

show platform port

Overview This command displays the various port registers or platform counters for specified switchports.

Syntax show platform port [*<port-list>*] [counters]

Parameter	Description
<i><port-list></i>	The ports to display information about. A port-list can be: • a switchport (e.g. port1.0.4) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4).
counters	Show the platform counters.

Mode Privileged Exec

Examples To display port registers for port1.0.1 to port1.0.4, use the command:

```
awplus# show platform port port1.0.1-port1.0.4
```

To display platform counters for port1.0.1 to port1.0.4, use the command:

```
awplus# show platform port port1.0.1-port1.0.4 counters
```

Output The following shows typical output.

Example output from the show platform port command

```
awplus#show platform port

Phy address is: 01

PHY 88E1680 Registers for dev 0 (port 1)
  Page 0 - Copper
    0 1140  1 7949  2 0141  3 0ED4  4 01E1  5 0000  6 0004  7 2001
    8 0000  9 0F00 10 4000 13 4007 14 0000 15 3000 16 3078 17 8040
   18 0000 19 0040 20 8020 21 0000 23 0000 26 0040 28 0000 29 0000
  Page 2 - Mac
    16 6048 18 0000 19 0000 21 1046
  ...
Clause 45 PHY Information for dev 0 port 1:

Device 3 PCS registers: length 4 devNum 0
0000=0000 0001=0042 0014=0006 0016=0000
Device 7 EEE autoneg registers: length 2 devNum 0
003C=0000 003D=0000

EEE Status and Configuration on dev 0 port 1:

EEE Mode (In Hardware):      OFF
EEE Admin Status:            Disabled
Link Partner EEE capable:    NO
Has Received Tx LP Idle:     NO
Has Received Rx LP Idle:     NO
Currently Receiving Tx LP Idle: NO
Currently Receiving Rx LP Idle: NO

Port configuration:
  lport 1  macStatus:      0x12001010      value: 0x0000E802
           macCtrl:        0x12001000      value: 0x00008BE5
           autoNegCtrl:    0x1200100C      value: 0x0000B0ED
           macCtrl1:       0x12001004      value: 0x00000C83
           macCtrl2:       0x12001008      value: 0x0000C009
           macCtrl3:       0x12001048      value: 0x00000300
           macCtrl4:       0x12001090      value: 0x00000102
           portControl:    0x01001000      value: 0x00208001
  ...
```

show port-security interface

Overview Use this command to show the current port-security configuration and status.

Syntax show port-security interface *<port>*

Parameter	Description
<i><port></i>	Specify the switch port or LAG to display information about. This can be a single switch port, (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Example To see the port-security status on port1.0.2, use the following command:
awplus# show port-security interface port1.0.2

Output The following shows typical output.

Example output from the show port-security interface command

```
Port Security configuration
Security Enabled       : YES
Port Status           : ENABLED
Violation Mode        : TRAP
Aging                 : OFF
Maximum MAC Addresses : 3
Total MAC ddresses    : 1
Lock Status           : UNLOCKED
Security Violation Count : 0
Last Violation Source Address : None
```

Related commands

- [clear port-security intrusion](#)
- [show port-security intrusion](#)
- [switchport port-security](#)
- [switchport port-security aging](#)
- [switchport port-security maximum](#)
- [switchport port-security violation](#)

show port-security intrusion

Overview Use this command to show the intrusion list. If the port is not specified, the entire intrusion table is shown.

Syntax show port-security intrusion [interface <port>]

Parameter	Description
interface	Specify a port
<port>	Specify the switch port or LAG to display information about. This can be a single switch port, (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Example To see the intrusion list on port1.0.2, use the following command:
awplus# show port-security intrusion interface port1.0.2

Output The following shows typical output.

Example output from the show port-security intrusion command for port1.0.2

```
Port Security Intrusion List
Interface: port1.0.2 -3 intrusion(s) detected
11-22-33-44-55-04 11-22-33-44-55-06 11-22-33-44-55-08
```

Related commands

- [clear port-security intrusion](#)
- [show port-security interface](#)
- [switchport port-security](#)
- [switchport port-security aging](#)
- [switchport port-security maximum](#)
- [switchport port-security violation](#)

show storm-control

Overview Use this command to display storm-control information for all interfaces or a particular interface.

Syntax `show storm-control [<port>]`

Parameter	Description
<code><port></code>	The port to display information about. The port may be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2)

Mode User Exec and Privileged Exec

Example To display storm-control information for port1.0.2, use the following command:

```
awplus# show storm-control port1.0.2
```

Output The following shows typical output.

Example output from the show storm-control command for port1.0.2

Port	BcastLevel	McastLevel	DlfLevel
port1.0.2	40. 0%	100. 0%	100. 0%

Related commands [storm-control level](#)

speed

Overview This command changes the speed of the specified port. You can optionally specify the speed or speeds that get autonegotiated, so autonegotiation is only attempted at the specified speeds.

To see the currently-negotiated speed for ports whose links are up, use the **show interface** command. To see the configured speed (when different from the default), use the **show running-config** command.

Depending on your switch model and the SFP or SFP+ modules you use, a subset of the following speed options will be available.

Syntax speed {10|100|1000|2500|5000|10000|40000|100000}
 speed auto [10] [100] [1000] [2500] [5000] [10000] [40000]
 [100000]

The following table shows the speed options for each type of port, depending on the model.

Port type	Speed Options (units are Mbps)
RJ.5 copper ports	auto (default) 10 100 1000
RJ-45 copper ports	auto (default) 10 100 1000 2500 5000 10000
tri-speed copper SFPs	auto (default) 10 100 1000
100 Mbps fiber SFPs	100
1000 Mbps fiber SFPs	auto (default) 1000
1000 Mbps copper SFPs	auto (default) 1000
1000 Mbps fiber CSFPs (Compact SFPs)	auto (default) 1000
Multi-speed copper SFP+	auto (default) 1000 2500 5000 10000
10000 Mbps fiber SFP+	auto (default)

Port type	Speed Options (units are Mbps)
	10000
10000 Mbps copper SFP+	auto (default) 10000
10000 Mbps Direct Attach Cable (DAC)	auto (default) 10000
40000 Mbps QSFP+	auto (default) 40000
40000 Mbps Direct Attach Cable (DAC)	auto (default) 40000
Breakout DACs for 4 x 10G connections	auto (default) 10000
100000 Mbps QSFP28	auto (default) 100000

Mode Interface Configuration

Default By default, ports autonegotiate speed (except for 100Base-FX ports which do not support auto-negotiation, so default to 100 Mbps).

Usage notes We recommend having autonegotiation enabled for link speeds of 1000 Mbps and above. For example, to apply a fixed speed of 1000 Mbps use the command **speed auto 1000**.

If multiple speeds are specified after the auto option to autonegotiate speeds, then the device only attempts autonegotiation at those specified speeds.

Switch ports in a static or dynamic (LACP) channel group must have the same port speed and be in full duplex mode. Once switch ports have been aggregated into a channel group, you can set the speed of all the switch ports in the channel group by applying this command to the channel group.

Examples awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# speed auto 1000

To return the port to auto-negotiating its speed, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# speed auto
```

Related commands **duplex**
ecofriendly lpi
polarity
show interface
speed (asyn)

storm-control level

Overview Use this command to specify the speed limiting level for broadcast, multicast, or dlf (destination lookup failure) traffic for the port. Storm-control limits the selected traffic type to the specified percentage of the maximum port speed.

Use the **no** variant of this command to disable storm-control for broadcast, multicast or dlf traffic.

Syntax storm-control {broadcast|multicast|dlf} level <level>
no storm-control {broadcast|multicast|dlf} level

Parameter	Description
<level>	<0-100> Specifies the percentage of the maximum port speed allowed for broadcast, multicast or destination lookup failure traffic.
broadcast	Applies the storm-control to broadcast frames.
multicast	Applies the storm-control to multicast frames.
dlf	Applies the storm-control to destination lookup failure traffic.

Default Disabled

Mode Interface Configuration

Usage notes Flooding techniques are used to block the forwarding of unnecessary flooded traffic. A packet storm occurs when a large number of broadcast packets are received on a port. Forwarding these packets can cause the network to slow down or time out.

More than one limit type can be set at a time. For example, you can configure both broadcast and multicast levels on the same port, at the same time.

Example To limit broadcast traffic on port1.0.2 to 30% of the maximum port speed, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# storm-control broadcast level 30
```

Related commands [show storm-control](#)

Command changes Version 5.4.9-1.3: Multiple limit types available on x530 series
Version 5.5.0-2.1: Multiple limit types available on x220 and GS980M series

switchport block unicast-flooding

Overview Use this command to enable Unknown Unicast Flood Prevention (UUF). The UUF feature prevents unknown unicast traffic from being flooded to all Layer 2 ports in a VLAN. When enabled, UUF only permits egress traffic for MAC addresses that are known to exist on the port.

Use the **no** variant of this command to disable UUF.

Syntax switchport block unicast-flooding
no switchport block unicast-flooding

Default UUF is off.

Mode Interface Configuration for a switchport.

Example To enable the UUF feature on port1.0.3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# switchport block unicast-flooding
```

To disable the UUF feature on port1.0.3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# no switchport block unicast-flooding
```

To check if UUF is enabled on port1.0.3, use the command:

```
awplus# show interface port1.0.3
```

```
awplus#show interface port1.0.3
Interface port1.0.3
Scope: both
Link is UP, administrative state is UP
Thrash-limiting
  Status Not Detected, Action learn-disable, Timeout 1(s)
Hardware is Ethernet, address is 0000.cd28.088a
index 5013 metric 1 mru 1500
current duplex full, current speed 1000, current polarity mdix
configured duplex auto, configured speed auto, configured polarity auto

SNMP link-status traps: Disabled
  input packets 0, bytes 0, dropped 0, multicast packets 0
  output packets 0, bytes 0, multicast packets 0, broadcast packets 0
  input average rate : 30 seconds 0 bps, 5 minutes 0 bps
  output average rate: 30 seconds 0 bps, 5 minutes 0 bps
Time since last state change: 0 days 00:00:35
Unknown unicast flooding blocking is enabled
```

Related commands [show interface](#)

Command changes Version 5.5.1-2.1: command added

switchport port-security

Overview Use this command to enable the port-security feature. This feature is also known as the port-based learn limit. It allows you to set the maximum number of MAC addresses that each port or link aggregation group (LAG) can learn (using the **switchport port-security maximum** command).

Use the **no** variant of this command to disable the port-security feature.

Syntax `switchport port-security`
`no switchport port-security`

Mode Interface Configuration for a switchport or LAG.

Usage notes After using this command to turn on port-security, use the following commands to configure it:

- **switchport port-security maximum** to set the number of MAC addresses that can be learned
- **switchport port-security aging** (optional) to choose whether to limit it to specific devices, or to allow any devices up to the limit
- **switchport port-security violation** (optional) to change the action the switch takes if the limit is violated.

LAGs use the link local MAC address. This address counts against the limit. If you apply port-security to a LAG, this means you need to allow port-security to learn the link local address as well as the MAC address of the devices you want to connect to the LAG. To do this, simply increase the limit by 1 (using the **switchport port-security maximum** command). For example, for a limit of 2 devices, set the limit to 3.

If the switch sees a new MAC address on a port or LAG that has port-security enabled, and the MAC address is statically configured for another port or LAG, this triggers a violation. The switch will ignore the maximum learn limit and will treat that MAC address as an intruder.

Examples To enable the port-security feature on port1.0.2 and set it to learn 1 MAC address, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport port-security
awplus(config-if)# switchport port-security maximum 1
```

To disable the port-security feature on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport port-security
```

To enable the port-security feature on the link aggregation group sa2 and set it to learn 1 MAC address, use the following commands. Note that the maximum is set to 2 so that the link local address can be learned as well as the desired MAC address:

```
awplus# configure terminal
awplus(config)# interface sa2
awplus(config-if)# switchport port-security
awplus(config-if)# switchport port-security maximum 2
```

To disable the port-security feature on sa2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface sa2
awplus(config-if)# no switchport port-security
```

Related commands

- clear port-security intrusion**
- show port-security interface**
- show port-security intrusion**
- switchport port-security aging**
- switchport port-security maximum**
- switchport port-security violation**

Command changes Version 5.5.1-0.1: port-security on LAGs added for SBx81CFC960, SBx908 GEN2, x950, x930, x550, x530, x530L, x320, x230, x230L and x220 Series switches

switchport port-security aging

Overview Use this command to set MAC addresses that have been learned by port security to age out.

Use the **no** variant of this command to set the MAC addresses to not age out.

Syntax switchport port-security aging
no switchport port-security aging

Default Disabled (MAC addresses do not age out)

Mode Interface Configuration for a switchport or LAG.

Usage notes Use this command to change from static to dynamic operation.

Static operation

Any MAC address learned will be statically installed into the MAC Address table and will not age out. The addresses are also added to the device's running configuration. Each entry then counts towards the maximum allowed addresses, regardless of whether the device is still connected.

Use this if you want to allow only specific devices to access the port. For example, this can prevent a person from plugging an unauthorized laptop into your corporate LAN.

This is the default mode.

Dynamic operation

Any MAC addresses learned will be dynamically installed into the MAC Address table. Unlike the static operation, no MAC addresses are added to the device's running configuration. If a device is disconnected, the Maximum MAC addresses allowed decreases by 1 (once the dynamic entry times out in the MAC Address table).

Use this if you want to allow only a limited number of devices to access the port, but you are not concerned about which specific devices have access. For example, this can prevent a person from plugging a switch into a port and creating an unauthorized internet cafe.

Examples To choose dynamic mode by setting port1.0.2 so that the MAC addresses that have been learned by port security age out, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport port-security aging
```

To return to static mode by stopping the MAC addresses that have been learned by port security from aging out on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport port-security aging
```

Related commands

- clear port-security intrusion**
- show port-security interface**
- show port-security intrusion**
- switchport port-security**
- switchport port-security maximum**
- switchport port-security violation**

Command changes Version 5.5.1-0.1: port-security on LAGs added for SBx81CFC960, SBx908 GEN2, x950, x930, x550, x530, x530L, x320, x230, x230L and x220 Series switches

switchport port-security maximum

Overview Use this command to set the maximum number of MAC addresses that each port or link aggregation group (LAG) can learn, when port-security is enabled on that port or LAG.

Use the **no** variant of this command to unset the maximum number of MAC addresses that can be learned. This is same as setting the maximum number to 0. This command also resets the intrusion list table.

Syntax switchport port-security maximum <0-256>
no switchport port-security maximum

Parameter	Description
maximum <0-256>	Specify the maximum number of addresses to learn.

Mode Interface Configuration for a switchport or LAG.

Usage notes Before using this command, turn on port-security with the **switchport port-security** command.

After using this command to specify the limit, you can use the following commands for further configuration:

- **switchport port-security aging** (optional) to choose whether to limit it to specific devices, or to allow any devices up to the limit
- **switchport port-security violation** (optional) to change the action the switch takes if the limit is violated.

LAGs use the link local MAC address. This address counts against the limit. If you apply port-security to a LAG, this means you need to allow port-security to learn the link local address as well as the MAC address of the devices you want to connect to the LAG. To do this, simply increase the limit by 1 (using the **switchport port-security maximum** command). For example, for a limit of 2 devices, set the limit to 3.

If the switch sees a new MAC address on a port or LAG that has port-security enabled, and the MAC address is statically configured for another port or LAG, this triggers a violation. The switch will ignore the maximum learn limit and will treat that MAC address as an intruder.

Examples To learn 3 MAC addresses on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport port-security
awplus(config-if)# switchport port-security maximum 3
```

To remove the MAC learning limit on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport port-security maximum
```

Related commands

- clear port-security intrusion**
- show port-security interface**
- show port-security intrusion**
- switchport port-security**
- switchport port-security aging**
- switchport port-security violation**

Command changes Version 5.5.1-0.1: port-security on LAGs added for SBx81CFC960, SBx908 GEN2, x950, x930, x550, x530, x530L, x320, x230, x230L and x220 Series switches

switchport port-security violation

Overview Use this command to set the action taken on a switch port or LAG when it exceeds the port-security learning limits.

The action can be **shutdown**, **restrict** or **protect**:

- **shutdown**: the physical link will be disabled and 'shutdown' will be shown in the configuration file.
- **restrict**: the packet from the unauthorized MAC will be discarded and an SNMP trap will be generated to alert management.
- **protect**: the packet will simply be discarded silently.

Use the **no** variant of this command to set the violation action to the default action of **protect**.

Syntax switchport port-security violation {shutdown|restrict|protect}
no switchport port-security violation

Parameter	Description
shutdown	Disable the port.
restrict	Discard and alert the network administrator.
protect	Discard the packet.

Mode Interface Configuration for a switchport or LAG.

Default Protect

Usage notes When modes restrict or shutdown are used, the administrator can also be alerted via an SNMP trap. To configure this, add the following command to the SNMP configuration:

```
awplus(config)# snmp-server enable trap nsm
```

Examples To set the action to be shutdown on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport port-security violation shutdown
```

To set the port-security action to the default (protect) on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport port-security violation
```

Related commands

- [clear port-security intrusion](#)
- [show port-security interface](#)
- [show port-security intrusion](#)
- [switchport port-security](#)
- [switchport port-security aging](#)
- [switchport port-security maximum](#)

Command changes Version 5.5.1-0.1: port-security on LAGs added for SBx81CFC960, SBx908 GEN2, x950, x930, x550, x530, x530L, x320, x230, x230L and x220 Series switches

thrash-limiting

Overview Use this command to configure the thrash limit action that will be applied to a port on the device when a thrashing condition is detected. The thrash-limiting timeout specifies the time, in seconds, for which the action is employed.

Use the **no** variant of this command to return the action or timeout to its default setting.

Syntax thrash-limiting {[action {learn-disable|link-down|port-disable|vlan-disable|none}} [timeout <0-86400>]]
no thrash-limiting {action|timeout}

Parameter	Description
action	The action taken when MAC thrashing is detected.
learn-disable	Disable MAC address learning
link-down	Block all traffic on an interface - link down
port-disable	Block all traffic on an interface - link remains up
vlan-disable	Block all traffic on a VLAN if the switch detects thrashing for that VLAN on the selected port. Note that setting this parameter will also enable ingress filtering.
none	No thrash action
timeout	Set the duration for the thrash action
<0-86400>	The duration of the applied thrash action in seconds. The default is 1 seconds.

Default The default action is learn-disable and the default timeout is 1 second.

Mode Interface Configuration

Usage Thrash-limiting actions are initiated when MAC addresses are added and removed from a port's MAC table faster than a given rate. The rate is 10 MAC address changes per second by default. You can change it with the **mac address-table thrash-limit** command.

See the "Thrash Limiting" section in the **Switching Feature Overview and Configuration Guide** for more information.

Examples To set the action to learn disable for port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# thrash-limiting action learn-disable
```

To block all traffic on a VLAN on port1.0.1 if the switch detects thrashing for that VLAN on that port, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# thrash-limiting action vlan-disable
```

To set the thrash limiting action to its default on port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no thrash-limiting action
```

To set the thrash limiting timeout to 5 seconds on port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# thrash-limiting timeout 5
```

To set the thrash limiting timeout value to its default on port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no thrash-limiting timeout
```

Related commands **mac address-table thrash-limit**
show interface

undebbug loopprot

Overview This command applies the functionality of the no **debug loopprot**.

undebug platform packet

Overview This command applies the functionality of the no **debug platform packet**.

14

VLAN Commands

- Contents**
- **Introduction** on page 635
 - **debug private-vlan ufo** on page 636
 - **platform acls-to-vlanclassifiers** on page 637
 - **port-vlan-forwarding-priority** on page 639
 - **private-vlan** on page 642
 - **private-vlan association** on page 644
 - **private-vlan ufo trap** on page 645
 - **show debugging private-vlan** on page 646
 - **show port-vlan-forwarding-priority** on page 647
 - **show vlan** on page 648
 - **show vlan access-map** on page 649
 - **show vlan classifier group** on page 650
 - **show vlan classifier group interface** on page 651
 - **show vlan classifier interface group** on page 652
 - **show vlan classifier rule** on page 653
 - **show vlan filter** on page 654
 - **show vlan private-vlan** on page 655
 - **show vlan private-vlan ufo** on page 656
 - **switchport access vlan** on page 658
 - **switchport enable vlan** on page 659
 - **switchport mode access** on page 660
 - **switchport mode private-vlan** on page 661
 - **switchport mode private-vlan trunk promiscuous** on page 662
 - **switchport mode private-vlan trunk secondary** on page 664
 - **switchport mode private-vlan ufo** on page 666
 - **switchport mode trunk** on page 668
 - **switchport private-vlan host-association** on page 669
 - **switchport private-vlan mapping** on page 670
 - **switchport trunk allowed vlan** on page 671
 - **switchport trunk native vlan** on page 674
 - **switchport vlan-stacking (double-tagging)** on page 676
 - **switchport voice dscp** on page 678
 - **switchport voice vlan** on page 679
 - **switchport voice vlan priority** on page 682
 - **vlan** on page 684
 - **vlan access-map** on page 686
 - **vlan classifier activate** on page 687

- **vlan classifier group** on page 688
- **vlan classifier rule ipv4** on page 689
- **vlan classifier rule proto** on page 690
- **vlan database** on page 694
- **vlan filter** on page 695

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure VLANs. For more information see the [VLAN Feature Overview and Configuration Guide](#).

debug private-vlan ufo

Overview Use this command to enable private-vlan Upward Forwarding Only (UFO) debugging.

Use the **no** variant of this command to disable private-vlan UFO debugging.

Syntax debug private-vlan ufo
no debug private-vlan ufo

Mode Privileged Exec

Usage notes Use this command to enable or disable private-vlan ufo debugging.

Example To enable private-vlan UFO debugging, use the commands:

```
awplus# configure terminal
awplus(config)# debug private-vlan ufo
```

Related commands [show debugging private-vlan](#)
[private-vlan ufo trap](#)
[switchport mode private-vlan ufo](#)

Command changes Version 5.5.3-1.1: added to x220, x230, x320, x550, x950, SBx908 GEN2 Series
Version 5.4.9-0.1: added to x530 Series
Version 5.4.8-2.1: added to SBx8100 Series
Version 5.4.7-2.1: command added

platform acls-to-vlanclassifiers

Overview Use this command to configure the amount of memory allocated (or split) between ACLs and VLAN classifiers.

Use the **no** variant of this command to reset the allocation to the default setting.

Syntax platform acls-to-vlanclassifiers {more-vlan-classifiers | half-and-half | more-acls}

no platform acls-to-vlanclassifiers

Parameter	Description
more-vlan-classifiers	Support more dynamic VLAN classifiers.
half-and-half	Support the same number of ACLs and VLAN classifiers.
more-acls	Support more ACLs.

Default More dynamic VLAN classifiers

Mode Global Configuration

Usage notes Access-lists and VLAN classifiers use the same memory/table in hardware. This command is used to split this memory to support more ACLs, more VLAN classifiers or the same number of ACLs and VLAN classifiers.

Note: For this command to take effect, you must copy it to the startup configuration using the **copy running-config startup-config** command and then reboot the switch.

Example To store more dynamic VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-vlan-
classifiers
```

To store the same number of ACLs and VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers half-and-half
```

To store more ACLs, use the following commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-acls
```

To reset the allocation to the default settings, use the commands:

```
awplus# configure terminal
awplus(config)# no platform acls-to-vlanclassifiers
```

Related commands

- show platform**
- show platform classifier statistics utilization brief**
- show running-config**
- show startup-config**

Command changes

- Version 5.4.9-0.1: command added
- Version 5.5.0-0.1: **tunnel-support** parameter added for x530 series

port-vlan-forwarding-priority

Overview Use this command to specify which protocol has the highest priority for controlling transitions from blocking to forwarding traffic, when more than one of EPSR, Loop Protection, and MAC thrashing protection are used on the switch.

These protocols use the same mechanism to block or forward traffic. This command specifies either EPSR or Loop Protection as the highest priority protocol. Setting the priority stops contention between protocols.

For more information, see the Usage section below.



CAUTION: The *and* parameter options must not be set on an EPSR master node. Use the *parameter* option on an EPSR master node instead. Setting this command incorrectly on an EPSR master node could cause unexpected broadcast storms.

Use the **no** variant of this command to restore the default highest priority protocol back to the default of EPSR.

For more information about EPSR, see the [EPSR Feature Overview and Configuration_Guide](#).

Syntax port-vlan-forwarding-priority {epsr|loop-protection|none}
no port-vlan-forwarding-priority

Parameter	Description
epsr	Sets EPSR as the highest priority protocol. Use this parameter on an EPSR master node to avoid unexpected broadcast storms.
loop-protection	Sets Loop Protection as the highest priority protocol. Note that this option must not be set on an EPSR master node. Use the epsr parameter option on an EPSR master node to avoid unexpected broadcast storms.
none	Sets the protocols to have equal priority. This allows protocols to override each other to set a port to forwarding for a VLAN. Note that this option must not be set on a EPSR master node. Use the epsr parameter option on an EPSR master node to avoid unexpected broadcast storms.

Default By default, the highest priority protocol is EPSR

Mode Global Configuration

Usage notes Usually, you only need to configure one of EPSR, Loop Protection and MAC Thrashing protection on a switch, because they perform similar functions –each prevents network loops by blocking a selected port for each (loop-containing) VLAN.

However, if more than one of these three features is configured on a switch, you can use this command to prioritize either EPSR or Loop Protection when their effects on a port would conflict and override each other. Without this command, each protocol could set a port to forwarding for a VLAN, sometimes overriding the previous setting by another protocol to block the port. This could sometimes lead to unexpected broadcast storms.

This command means that, when a protocol is set to have the highest priority over a data VLAN on a port, it will not allow other protocols to put that port-vlan into a forwarding state if the highest priority protocol blocked it.

The priority mechanism is only used for blocking-to-forwarding transitions; protocols remain independent on the forwarding-to-blocking transitions.

For example, consider an EPSR master node in a two-node ESPR ring with the following settings:

- The EPSR master node primary port is configured to switchport interface port1.0.1
- The EPSR master node secondary port is configured to switchport interface port1.0.2
- The EPSR master node control VLAN is configured to VLAN interface vlan10
- The EPSR master node has a first data VLAN configured to VLAN interface vlan20
- The EPSR master node has a second data VLAN configured to VLAN interface vlan30.

Initially, the EPSR ring is complete, with port1.0.2 blocking data VLANs vlan20 and vlan30 and some broadcast traffic flowing through. If the user removes vlan30 from EPSR, a storm is created on vlan30. MAC thrashing protection detects it and blocks vlan30.

Then after the storm has stopped, MAC thrashing protection sets it to forwarding again and it keeps oscillating between forwarding and blocking. In the meantime, the user adds back vlan30 to EPSR as a data VLAN and EPSR blocks it on port1.0.2.

If the priority is set to none (**port-vlan-forwarding-priority none**), MAC thrashing protection notices that the storm has stopped again and decides to put vlan30 on port1.0.2 into forwarding state. This overrides what EPSR requires for this port-VLAN and creates a storm.

If the priority is set to EPSR or default (**port-vlan-forwarding-priority epsr**), MAC thrashing protection notices that the storm has stopped again and attempts to put vlan30 on port1.0.2 into forwarding

state. The higher priority protocol (EPSR) is blocking the VLAN on this port, so it stays blocking and no storm occurs.

Example To prioritize EPSR over Loop Protection or MAC Thrashing protection settings, so that Loop Protection or MAC Thrashing protection cannot set a port to the forwarding state for a VLAN if EPSR has set it to the blocking state, use the commands:

```
awplus# configure terminal
awplus(config)# port-vlan-forwarding-priority epsr
```

To prioritize Loop Protection over EPSR or MAC Thrashing protection settings, so that EPSR or MAC Thrashing protection cannot set a port to the forwarding state for a VLAN if Loop Protection has set it to the blocking state, use the commands:

```
awplus# configure terminal
awplus(config)# port-vlan-forwarding-priority loop-protection
```

To set EPSR, Loop Protection, and MAC Thrashing protection protocols to have equal priority for port forwarding and blocking, which allows the protocols to override each other to set a port to the forwarding or blocking states, use the commands:

```
awplus# configure terminal
awplus(config)# port-vlan-forwarding-priority none
```

To restore the default highest priority protocol back to the default of EPSR, use the commands:

```
awplus# configure terminal
awplus(config)# no port-vlan-forwarding-priority
```

Related commands [show port-vlan-forwarding-priority](#)

private-vlan

Overview Use this command to create a private VLAN. Private VLANs can be either primary or secondary. Secondary VLANs can be either community or isolated.

Alternatively, private VLANs can be UFO (Upstream Forwarding Only). Private VLAN port members are either 'downstream' or 'upstream'. Once a private VLAN is configured as UFO, its port members by default are downstream.

Use the **no** variant of this command to remove the specified private VLAN.

For more information, see the [VLAN Feature Overview and Configuration Guide](#).

Syntax `private-vlan <vlan-id> {community|isolated|primary}`
`no private-vlan <vlan-id> {community|isolated|primary}`

Parameter	Description
<vlan-id>	VLAN ID in the range <2-4094> for the VLAN which is to be made a private VLAN.
community	Community VLAN.
isolated	Isolated VLAN.
primary	Primary VLAN.
ufo	Upstream Forwarding Only (UFO) VLAN.

Mode VLAN Configuration

Examples To configure a set of private VLANs, use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 2 name vlan2 state enable
awplus(config-vlan)# vlan 3 name vlan3 state enable
awplus(config-vlan)# vlan 4 name vlan4 state enable
awplus(config-vlan)# private-vlan 2 primary
awplus(config-vlan)# private-vlan 3 isolated
awplus(config-vlan)# private-vlan 4 community
```

To remove a set of private VLANs, use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# no private-vlan 2 primary
awplus(config-vlan)# no private-vlan 3 isolated
awplus(config-vlan)# no private-vlan 4 community
```

To configure a private VLAN for Upward Forwarding Only (UFO), use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 512 name vlan512 state enable
awplus(config-vlan)# private-vlan 512 ufo
```

**Related
commands**

show vlan private-vlan

**Command
changes**

Version 5.5.3-1.1: **ufo** parameter added to x220, x230, x320, x550, x950, SBx908 GEN2 Series

Version 5.4.9-0.1: **ufo** parameter added to x530 Series

Version 5.4.8-2.1: **ufo** parameter added to SBx8100 Series

Version 5.4.7-2.1: **ufo** parameter added

private-vlan association

Overview Use this command to associate a secondary VLAN to a primary VLAN. Only one isolated VLAN can be associated to a primary VLAN. Multiple community VLANs can be associated to a primary VLAN.

Use the **no** variant of this command to remove association of all the secondary VLANs to a primary VLAN.

For more information, see the [VLAN_Feature Overview and Configuration Guide](#).

Syntax `private-vlan <primary-vlan-id> association {add <secondary-vlan-id>|remove <secondary-vlan-id>}`
`no private-vlan <primary-vlan-id> association`

Parameter	Description
<code><primary-vlan-id></code>	VLAN ID of the primary VLAN.
<code><secondary-vlan-id></code>	VLAN ID of the secondary VLAN (either isolated or community).

Mode VLAN Configuration

Examples The following commands associate primary VLAN 2 with secondary VLAN 3:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# private-vlan 2 association add 3
```

The following commands remove the association of primary VLAN 2 with secondary VLAN 3:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# private-vlan 2 association remove 3
```

The following commands remove all secondary VLAN associations of primary VLAN 2:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# no private-vlan 2 association
```


private-vlan ufo trap

Overview Use this command to enable the sending of SNMP traps for private VLAN UFO.

Use the **no** variant of this command to disable the sending of SNMP traps for private VLAN UFO.

Syntax private-vlan ufo trap
no private-vlan ufo trap

Parameter	Description
ufo	Specifies private-vlan for those VLANs in UFO mode.
trap	Enables or disables SNMP trap sending for private-vlan UFO.

Default Enabled.

Mode Global Configuration

Usage notes This command activates SNMP traps for the private-vlan UFO. When enabled, traps will be sent when any UFO VLAN becomes 'isolated'. This happens when traffic cannot be forwarded at Layer 2 due to the absence of an upstream port for the UFO VLAN, and Layer 3 forwarding has not been configured for that VLAN.

Example To configure a private-vlan UFO trap use the commands:

```
awplus# configure terminal
awplus(config)# private-vlan ufo trap
```

Related commands [private-vlan](#)
[snmp-server enable trap](#)

Command changes Version 5.5.3-1.1: added to x220, x230, x320, x550, x950, SBx908 GEN2 Series

Version 5.4.9-0.1: added to x530 Series

Version 5.4.8-2.1: added to SBx8100 Series

Version 5.4.7-2.1: command added

show debugging private-vlan

Overview Use this command to show whether debugging for a private-vlan, namely UFO, is enabled.

Syntax show debugging private-vlan

Mode Privileged Exec

Example To show if debugging is enabled for private-vlan UFO, use the command:
awplus# show debugging private-vlan

Output The following shows typical output.

Example output from show debugging private-vlan

```
awplus#show debugging private-vlan  
  
Private-VLAN debugging status:  
UFO debugging is off
```

Related commands [debug private-vlan ufo](#)

Command changes Version 5.5.3-1.1: added to x220, x230, x320, x550, x950, SBx908 GEN2 Series

Version 5.4.9-0.1: added to x530 Series

Version 5.4.8-2.1: added to SBx8100 Series

Version 5.4.7-2.1: command added

show port-vlan-forwarding-priority

Overview Use this command to display the highest priority protocol that controls port-vlan forwarding or blocking traffic. This command displays whether EPSR or Loop Protection is set as the highest priority for determining whether a port forwards a VLAN, as set by the [port-vlan-forwarding-priority](#) command.

For more information about EPSR, see the [EPSR Feature Overview and Configuration Guide](#).

Syntax show port-vlan-forwarding-priority

Mode Privileged Exec

Example To display the highest priority protocol, use the command:

```
awplus# show port-vlan-forwarding-priority
```

Output The following shows typical output.

Example output from the show port-vlan-forwarding-priority command

```
Port-vlan Forwarding Priority: EPSR
```

Related commands [port-vlan-forwarding-priority](#)

show vlan

Overview Use this command to display information about a particular VLAN by specifying its VLAN ID. Selecting **all** will display information for all the VLANs configured.

Syntax `show vlan {all|brief|dynamic|static|auto|static-ports|<1-4094>}`

Parameter	Description
<1-4094>	Display information about the VLAN specified by the VLAN ID.
all	Display information about all VLANs on the device.
brief	Display information about all VLANs on the device.
dynamic	Display information about all VLANs learned dynamically.
static	Display information about all statically configured VLANs.
auto	Display information about all auto-configured VLANs.
static-ports	Display static egress/forbidden ports.

Mode User Exec and Privileged Exec

Example To display information about VLAN 2, use the command:

```
awplus# show vlan 2
```

Output The following shows typical output.

Example output from the show vlan command

VLAN ID	Name	Type	State	Member ports (u)-Untagged, (t)-Tagged
2	VLAN0002	STATIC	ACTIVE	port1.0.3(u) port1.0.4(u) port1.0.5(u) port1.0.6(u)
...				

Related commands

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

show vlan access-map

Overview Use this command to display information about the configured VLAN access-maps. VLAN access-maps contain a series of ACLs and enable you to filter traffic ingress specified VLANs.

Syntax show vlan access-map [<name>]

Parameter	Description
<name>	The name of the access-map to display.

Mode User Exec/Privileged Exec

Example To display the ACLs in all access-maps, use the command:

```
awplus# show vlan access-map
```

Output The following shows typical output.

Example output from show vlan access-map

```
awplus#show vlan access-map

Vlan access map : deny_all
Hardware MAC access list 4000
  10 deny any any

Vlan access map : ip_range
Hardware IP access list 3000
  10 deny ip 192.168.1.1/24 any
```

Related commands [vlan access-map](#)

Command changes Version 5.4.6-2.1: command added

show vlan classifier group

Overview Use this command to display information about all configured VLAN classifier groups or a specific group.

Syntax show vlan classifier group [<1-16>]

Parameter	Description
<1-16>	VLAN classifier group identifier

Mode User Exec and Privileged Exec

Usage If a group ID is not specified, all configured VLAN classifier groups are shown. If a group ID is specified, a specific configured VLAN classifier group is shown.

Example To display information about VLAN classifier group 1, enter the command:
awplus# show vlan classifier group 1

Related commands [vlan classifier group](#)

show vlan classifier group interface

Overview Use this command to display information about a single switch port interface for all configured VLAN classifier groups.

Syntax show vlan classifier group interface *<switch-port>*

Parameter	Description
<i><switch-port></i>	Specify the switch port interface classifier group identifier

Mode User Exec and Privileged Exec

Usage notes All configured VLAN classifier groups are shown for a single interface.

Example To display VLAN classifier group information for switch port interface port1.0.2, enter the command:

```
awplus# show vlan classifier group interface port1.0.2
```

Output The following shows typical output.

Example output from the show vlan classifier group interface port1.0.1 command:

```
vlan classifier group 1 interface port1.0.1
```

Related commands [vlan classifier group](#)
[show vlan classifier interface group](#)

show vlan classifier interface group

Overview Use this command to display information about all interfaces configured for a VLAN group or all the groups.

Syntax show vlan classifier interface group [<1-16>]

Parameter	Description
<1-16>	VLAN classifier interface group identifier

Mode User Exec and Privileged Exec

Usage notes If a group ID is not specified, all interfaces configured for all VLAN classifier groups are shown. If a group ID is specified, the interfaces configured for this VLAN classifier group are shown.

Example To display information about all interfaces configured for all VLAN groups, enter the command:

```
awplus# show vlan classifier interface group
```

To display information about all interfaces configured for VLAN group 1, enter the command:

```
awplus# show vlan classifier interface group 1
```

Output The following shows typical output.

Example output from the show vlan classifier interface group command

```
vlan classifier group 1 interface port1.0.1
vlan classifier group 1 interface port1.0.2
vlan classifier group 2 interface port1.0.3
vlan classifier group 2 interface port1.0.4
```

Example output from the show vlan classifier interface group 1 command

```
vlan classifier group 1 interface port1.0.1
vlan classifier group 1 interface port1.0.2
```

Related commands [vlan classifier group](#)
[show vlan classifier group interface](#)

show vlan classifier rule

Overview Use this command to display information about all configured VLAN classifier rules or a specific rule.

Syntax show vlan classifier rule [<1-256>]

Parameter	Description
<1-256>	VLAN classifier rule identifier

Mode User Exec and Privileged Exec

Usage If a rule ID is not specified, all configured VLAN classifier rules are shown. If a rule ID is specified, a specific configured VLAN classifier rule is shown.

Example To display information about VLAN classifier rule 1, enter the command:

```
awplus# show vlan classifier rule 1
```

Output The following shows typical output.

Example output from the show vlan classifier rule 1 command

```
vlan classifier group 1 add rule 1
```

Related commands

- [vlan classifier activate](#)
- [vlan classifier rule ipv4](#)
- [vlan classifier rule proto](#)

show vlan filter

Overview Use this command to display information about the configured VLAN filters. VLAN filters apply access-maps (and therefore ACLs) to VLANs. This enables you to filter traffic ingressing specified VLANs.

Syntax show vlan filter [*<access-map-name>*]

Parameter	Description
<i><access-map-name></i>	The name of an access-map. The command output displays only the filters that use that access-map.

Mode User Exec/Privileged Exec

Example To display information about the filter that uses the access-map named "deny_all", use the command:

```
awplus# show vlan filter deny_all
```

Output The following shows typical output.

Example output from show vlan filter

```
awplus#show vlan filter deny_all
Vlan filter : deny_all
  direction : ingress
  vlan list : 48-49
  access map : deny_all
Hardware MAC access list 4000
  10 deny any any
```

Related commands [vlan access-map](#)
[vlan filter](#)

Command changes Version 5.4.6-2.1: command added

show vlan private-vlan

Overview Use this command to display the private VLAN configuration and associations.

Syntax show vlan private-vlan

Mode User Exec and Privileged Exec

Example To display the private VLAN configuration and associations, enter the command:

```
awplus# show vlan private-vlan
```

Output The following shows typical output.

Example output from the show vlan private-vlan command

awplus#show vlan private-vlan			
PRIMARY	SECONDARY	TYPE	INTERFACES
-----	-----	-----	-----
2	3	isolated	
2	4	community	
	8	isolated	

Related commands [private-vlan](#)
[private-vlan association](#)

show vlan private-vlan ufo

Overview Use this command to show the configuration status of a private VLAN UFO-based VLAN(s) and member interfaces.

Syntax show vlan private-vlan ufo {all|<vlan-id>}

Parameter	Description
<vlan-id>	A specific VLAN. This must have been configured previously as a private-vlan UFO.
all	All VLANs that have been configured previously as private-vlan UFO.

Mode User Exec/Privileged Exec.

Usage notes Private VLANs can be UFO (Upstream Forwarding Only). Private VLAN port members are either "downstream" or "upstream" which are controlled by a protocol or by static configuration.

Example To show all the private-vlan UFO interfaces, use the command:

```
awplus# show vlan private-vlan ufo all
```

Output The following shows typical output.

Example output from show vlan private-vlan ufo all

awplus#show vlan private-vlan ufo all					
VLAN	INTERFACES	CONFIGURED	TYPE	PROTOCOL	MISC
100	port1.0.1	primary-upstream	upstream	UFO	-
100	port1.0.2	secondary-upstream	downstream	UFO	-
100	port1.0.3	-	downstream	Static	-
200	port1.0.4	epsr	downstream	EPSR	-
200	sa1	epsr	upstream	EPSR	0030.846e.bac7
200	port1.0.5	-	downstream	Static	-
300	port1.0.6	-	downstream-fault	Static	-
300	port1.0.7	-	downstream-fault	Static	-
300	port1.0.8	-	downstream-fault	Static	-
400	Port1.0.9	stp	upstream	STP	0030.846e.9bf4
400	Port1.0.10	stp	downstream	STP	-
400	Port1.0.11	-	downstream	Static	-

Command changes Version 5.5.3-1.1: added to x220, x230, x320, x550, x950, SBx908 GEN2 Series
Version 5.4.9-0.1: added to x530 Series
Version 5.4.8-2.1: added to SBx8100 Series
Version 5.4.7-2.1: command added

switchport access vlan

Overview Use this command to change the port-based VLAN of the current port.
Use the **no** variant of this command to change the port-based VLAN of this port to the default VLAN, which is VLAN 1.

Syntax switchport access vlan <vlan-id>
no switchport access vlan

Parameter	Description
<vlan-id>	<1-4094> The port-based VLAN ID for the port.

Default VLAN 1

Mode Interface Configuration

Usage notes Any untagged frame received on this port will be associated with the specified VLAN.

Examples To change the port-based VLAN to VLAN 3 for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport access vlan 3
```

To reset the port-based VLAN to the default VLAN 1 for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport access vlan
```

Related commands [show interface switchport](#)
[show vlan](#)

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

switchport enable vlan

Overview This command enables the VLAN on the port manually once disabled by certain actions, such as QSP (QoS Storm Protection) or EPSR (Ethernet Protection Switching Ring). Note that if the VID is not given, all disabled VLANs are re-enabled.

Syntax switchport enable vlan [<1-4094>]

Parameter	Description
vlan	Re-enables the VLAN on the port.
<1-4094>	VLAN ID.

Mode Interface Configuration

Example To re-enable port1.0.2 from VLAN 1:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport enable vlan 1
```

Related commands [show mls qos interface storm-status](#)
[storm-window](#)

switchport mode access

Overview Use this command to set the switching characteristics of the port to access mode. Received frames are classified based on the VLAN characteristics, then accepted or discarded based on the specified filtering criteria.

Syntax `switchport mode access [ingress-filter {enable|disable}]`

Parameter	Description
ingress-filter	Set the ingress filtering for the received frames.
enable	Turn on ingress filtering for received frames. This is the default.
disable	Turn off ingress filtering to accept frames that do not meet the classification criteria.

Default By default, ports are in access mode with ingress filtering on.

Usage notes Use access mode to send untagged frames only.

Mode Interface Configuration

Example

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access ingress-filter enable
```

Related Commands [show interface switchport](#)

Command changes

Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V

Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

switchport mode private-vlan

Overview Use this command to make a Layer 2 port a private VLAN host port or a promiscuous port.

Use the **no** variant of this command to remove the configuration.

Syntax switchport mode private-vlan {host|promiscuous}
no switchport mode private-vlan {host|promiscuous}

Parameter	Description
host	This port type can communicate with all other host ports assigned to the same community VLAN, but it cannot communicate with the ports in the same isolated VLAN. All communications outside of this VLAN must pass through a promiscuous port in the associated primary VLAN.
promiscuous	A promiscuous port can communicate with all interfaces, including the community and isolated ports within a private VLAN.

Mode Interface Configuration

Examples To configure host mode, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode private-vlan host
```

To configure promiscuous mode, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# switchport mode private-vlan promiscuous
```

To remove promiscuous mode, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# no switchport mode private-vlan promiscuous
```

Related commands [switchport private-vlan mapping](#)

switchport mode private-vlan trunk promiscuous

Overview Use this command to enable a port in trunk mode to be a promiscuous port for isolated VLANs.

NOTE:

Private VLAN trunk ports are not supported by the current AlliedWare Plus GVRP implementation. Private VLAN trunk ports and GVRP are mutually exclusive.

Use the **no** variant of this command to remove a port in trunk mode as a promiscuous port for isolated VLANs. You must first remove the secondary port, or ports, in trunk mode associated with the promiscuous port with the **no switchport mode private-vlan trunk secondary** command.

Syntax switchport mode private-vlan trunk promiscuous group <group-id>
no switchport mode private-vlan trunk promiscuous

Parameter	Description
<group-id>	The group ID is a numeric value in the range 1 to 32 that is used to associate the promiscuous port with secondary ports.

Default By default, a port in trunk mode is disabled as a promiscuous port.

Mode Interface Configuration

Usage notes A port must be put in trunk mode with **switchport mode trunk** command before it can be enabled as a promiscuous port.

To add VLANs to be trunked over the promiscuous port, use the **switchport trunk allowed vlan** command. These VLANs can be isolated VLANs, or non-private VLANs.

To configure the native VLAN for the promiscuous port, use the **switchport trunk native vlan** command. The native VLAN can be an isolated VLAN, or a non-private VLAN.

When you enable a promiscuous port, all of the secondary port VLANs associated with the promiscuous port via the group ID number must be added to the promiscuous port. In other words, the set of VLANs on the promiscuous port must be a superset of all the VLANs on the secondary ports within the group.

Examples To create the isolated VLANs 2, 3 and 4 and then enable port1.0.2 in trunk mode as a promiscuous port for these VLANs with the group ID of 3, use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 2-4
awplus(config-vlan)# private-vlan 2 isolated
awplus(config-vlan)# private-vlan 3 isolated
awplus(config-vlan)# private-vlan 4 isolated
awplus(config-vlan)# exit
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode trunk
awplus(config-if)# switchport trunk allowed vlan add 2-4
awplus(config-if)# switchport mode private-vlan trunk
promiscuous group 3
```

To remove port1.0.2 in trunk mode as a promiscuous port for a private VLAN, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport mode private-vlan trunk
promiscuous
```

Note that you must remove the secondary port or ports enabled as trunk ports that are associated with the promiscuous port before removing the promiscuous port.

Related commands

- switchport mode private-vlan trunk secondary**
- switchport mode trunk**
- switchport trunk allowed vlan**
- switchport trunk native vlan**
- show vlan private-vlan**

switchport mode private-vlan trunk secondary

Overview Use this command to enable a port in trunk mode to be a secondary port for isolated VLANs.

NOTE:

Private VLAN trunk ports are not supported by the current AlliedWare Plus GVRP implementation. Private VLAN trunk ports and GVRP are mutually exclusive.

Use the **no** variant of this command to remove a port in trunk mode as a secondary port for isolated VLANs.

Syntax switchport mode private-vlan trunk secondary group <group-id>
no switchport mode private-vlan trunk secondary

Parameter	Description
<group-id>	The group ID is a numeric value in the range 1 to 32 that is used to associate a secondary port with its promiscuous port.

Default By default, a port in trunk mode is disabled as a secondary port.

When a port in trunk mode is enabled to be a secondary port for isolated VLANs, by default it will have a native VLAN of **none** (no native VLAN specified).

Mode Interface Configuration

Usage notes A port must be put in trunk mode with **switchport mode trunk** command before the port is enabled as a secondary port in trunk mode.

To add VLANs to be trunked over the secondary port use the **switchport trunk allowed vlan** command. These must be isolated VLANs and must exist on the associated promiscuous port.

To configure the native VLAN for the secondary port, use the **switchport trunk native vlan** command. The native VLAN must be an isolated VLAN and must exist on the associated promiscuous port.

Examples To create isolated private VLAN 2 and then enable port1.0.3 in trunk mode as a secondary port for this VLAN with the group ID of 3, use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 2
awplus(config-vlan)# private-vlan 2 isolated
awplus(config-vlan)# exit
awplus(config)# interface port1.0.3
awplus(config-if)# switchport mode trunk
awplus(config-if)# switchport trunk allowed vlan add 2
awplus(config-if)# switchport mode private-vlan trunk secondary
group 3
```

To remove port1.0.3 in trunk mode as a secondary port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# no switchport mode private-vlan trunk
secondary
```

Related commands

- [**switchport mode private-vlan trunk promiscuous**](#)
- [**switchport mode trunk**](#)
- [**switchport trunk allowed vlan**](#)
- [**switchport trunk native vlan**](#)
- [**show vlan private-vlan**](#)

switchport mode private-vlan ufo

Overview Use this command to allow private VLAN UFO 802.1q member ports to be configured as upstream or downstream.

Use the **no** variant of this command to change the role of the private VLAN UFO 802.1q member port to downstream.

Syntax switchport mode private-vlan ufo <vid-list> {primary-upstream|secondary-upstream|stp|epsr}
no switchport mode private-vlan ufo <vid-list>

Parameter	Description
<vid-list>	A hyphen-separated range or a comma-separated list of VLAN IDs, all of which must have previously been configured with the private-vlan setting of "ufo".
primary-upstream	The primary interface port/LAG that this UFO VLAN will attempt to use as the Upstream interface. More than one primary-upstream interface can be configured.
secondary-upstream	The interface that this UFO VLAN will revert to use as the Upstream port if all the primary-upstream ports are unavailable due to being either operationally down (i.e. Link Down) or blocked from forwarding (e.g. STP). More than one secondary-upstream interface can be configured.
stp	Let STP determine whether this interface is upstream or downstream. STP will determine if this interface plays the role of an STP Root Port for the CIST, or for the MSTI that this UFO VLAN belongs to. If it is, then UFO will designate this interface as an Upstream interface member for this UFO VLAN. Otherwise it is Downstream.
epsr	Let EPSR determine whether this interface is upstream or downstream. If this UFO VLAN is a protected data VLAN in an EPSR instance, and this interface is one of the transit node's interfaces, then this interface will determine if an EPSR Master is reachable from this interface. If it is, then UFO will designate this interface as an Upstream interface member for this UFO VLAN. Otherwise it is Downstream.

Default Downstream.

Note: The default setting for a private VLAN UFO member interface is downstream, but it is not explicitly configured. Use the **no** variant of this command to make the member interface downstream.

Mode Interface Configuration

Example To configure a private VLAN UFO trunk port as primary-upstream, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode trunk
awplus(config-if)# switchport trunk allowed vlan add 100
awplus(config-if)# switchport mode private-vlan ufo 100 primary-upstream
```

To change the role of the private VLAN UFO 802.1q member port back to the default of downstream, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport mode private-vlan ufo 100
```

Related commands **private-vlan**
show vlan private-vlan ufo

Command changes Version 5.5.3-1.1: added to x220, x230, x320, x550, x950, SBx908 GEN2 Series

Version 5.4.9-0.1: added to x530 Series

Version 5.4.8-2.1: added to SBx8100 Series

Version 5.4.7-2.1: command added

switchport mode trunk

Overview Use this command to set the switching characteristics of the port to trunk. Received frames are classified based on the VLAN characteristics, then accepted or discarded based on the specified filtering criteria.

Syntax `switchport mode trunk [ingress-filter {enable|disable}]`

Parameter	Description
ingress-filter	Set the ingress filtering for the frames received.
enable	Turn on ingress filtering for received frames. This is the default.
disable	Turn off ingress filtering to accept frames that do not meet the classification criteria.

Default By default, ports are in access mode, are untagged members of the default VLAN (VLAN 1), and have ingress filtering on.

Mode Interface Configuration

Usage notes A port in trunk mode can be a tagged member of multiple VLANs, and an untagged member of one native VLAN.

To configure which VLANs this port will trunk for, use the [switchport trunk allowed vlan](#) command.

Example

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# switchport mode trunk ingress-filter enable
```

Related Commands [show interface switchport](#)

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

switchport private-vlan host-association

Overview Use this command to associate a primary VLAN and a secondary VLAN to a host port. Only one primary and secondary VLAN can be associated to a host port.

Use the **no** variant of this command to remove the association.

Syntax `switchport private-vlan host-association <primary-vlan-id> add <secondary-vlan-id>`
`no switchport private-vlan host-association`

Parameter	Description
<code><primary-vlan-id></code>	VLAN ID of the primary VLAN.
<code><secondary-vlan-id></code>	VLAN ID of the secondary VLAN (either isolated or community).

Mode Interface Configuration

Examples `awplus# configure terminal`
`awplus(config)# interface port1.0.2`
`awplus(config-if)# switchport private-vlan host-association 2`
`add 3`
`awplus# configure terminal`
`awplus(config)# interface port1.0.2`
`awplus(config-if)# no switchport private-vlan host-association`

switchport private-vlan mapping

Overview Use this command to associate a primary VLAN and a set of secondary VLANs to a promiscuous port.

Use the **no** variant of this to remove all the association of secondary VLANs to primary VLANs for a promiscuous port.

Syntax `switchport private-vlan mapping <primary-vlan-id> add <secondary-vid-list>`
`switchport private-vlan mapping <primary-vlan-id> remove <secondary-vid-list>`
`no switchport private-vlan mapping`

Parameter	Description
<code><primary-vlan-id></code>	VLAN ID of the primary VLAN.
<code><secondary-vid-list></code>	VLAN ID of the secondary VLAN (either isolated or community), or a range of VLANs, or a comma-separated list of VLANs and ranges.

Mode Interface Configuration

Usage notes This command can be applied to a switch port or a static channel group, but not a dynamic (LACP) channel group. LACP channel groups (dynamic/LACP aggregators) cannot be promiscuous ports in private VLANs.

Examples `awplus# configure terminal`
`awplus(config)# interface port1.0.2`
`awplus(config-if)# switchport private-vlan mapping 2 add 3-4`
`awplus(config-if)# switchport private-vlan mapping 2 remove 3-4`
`awplus(config-if)# no switchport private-vlan mapping`

Related commands [switchport mode private-vlan](#)

switchport trunk allowed vlan

Overview Use this command to add VLANs to be trunked over this switch port. Traffic for these VLANs can be sent and received on the port.

Use the **no** variant of this command to reset switching characteristics of a specified interface to negate a trunked configuration specified with **switchport trunk allowed vlan** command.

Syntax

```
switchport trunk allowed vlan all
switchport trunk allowed vlan none
switchport trunk allowed vlan add <vid-list>
switchport trunk allowed vlan remove <vid-list>
switchport trunk allowed vlan except <vid-list>
no switchport trunk
```

Parameter	Description
all	Allow all VLANs to transmit and receive through the port.
none	Allow no VLANs to transmit and receive through the port.
add	Add a VLAN to the list of VLANs that are allowed to transmit and receive through the port. Only use this parameter if a list of VLANs is already configured on a port.
remove	Remove a VLAN from the list of VLANs that are allowed to transmit and receive through the port. Only use this parameter if a list of VLANs is already configured on a port. If you are removing VLAN port membership for a large number of switchports and VLANs, note that this command may take a number of minutes to run.
except	All VLANs, except the VLAN for which the VID is specified, are part of its port member set. Only use this parameter to remove VLANs after either this parameter or the all parameter have added VLANs to a port.
<vid-list>	<2-4094> The ID of the VLAN or VLANs that will be added to, or removed from, the port. A single VLAN, VLAN range, or comma-separated VLAN list can be set. For a VLAN range, specify two VLAN numbers: lowest, then highest number in the range, separated by a hyphen. For a VLAN list, specify the VLAN numbers separated by commas. Do not enter spaces between hyphens or commas when setting parameters for VLAN ranges or lists.

Default By default, ports are untagged members of the default VLAN (VLAN 1).

Mode Interface Configuration

Usage notes The **all** parameter sets the port to be a tagged member of all the VLANs configured on the device. The **none** parameter removes all VLANs from the port's tagged member set. The **add** and **remove** parameters will add and remove VLANs to and from the port's member set. The **except** parameter creates an exception to the list.

If you use the **all** parameter, and then you want to remove VLANs from the port's member list, you must use the **except** parameter to remove the unwanted VLANs. Similarly, if you use the **except** parameter to remove a list of VLANs, and you want to change that list, you must use the **except** parameter to make that change (not the **add** and **remove** parameters).

For example, if you want to remove VLAN3-5 from a port and the port's configuration is currently **switchport trunk allowed vlan all**, then you should remove VLAN3-5 by entering the **except** parameter, instead of using the **remove** parameter. This means using the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.6
awplus(config-if)# switchport trunk allowed vlan except 3-5
```

If you do this, then the configuration changes to:

```
awplus#show running-config
interface port1.0.6
switchport
switchport mode trunk
switchport trunk allowed vlan except 3-5
```

For example, if you want to add VLAN4 back in again, and the port configuration is currently **switchport trunk allowed vlan except 3-5**, then you should add VLAN4 by re-entering the **except** parameter with the list of VLANs to remove, instead of using the **add** parameter. This means using the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.6
awplus(config-if)# switchport trunk allowed vlan except 3,5
```

If you do this, then the configuration changes to:

```
awplus#show running-config
interface port1.0.6
switchport
switchport mode trunk
switchport trunk allowed vlan except 3,5
```

Examples The following shows adding a single VLAN to a port's member set.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport trunk allowed vlan add 2
```

The following shows adding a range of VLANs to a port's member set.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport trunk allowed vlan add 2-4
```

The following shows adding a list of VLANs to a port's member set.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport trunk allowed vlan add 2,3,4
```

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

switchport trunk native vlan

Overview Use this command to configure the native VLAN for this port. The native VLAN is used for classifying the incoming untagged packets. Use the **none** parameter with this command to remove the native VLAN from the port and set the acceptable frame types to VLAN-tagged only.

Use the **no** variant of this command to reset the native VLAN to the default VLAN ID 1 and remove tagged VLANs from the port.

Syntax switchport trunk native vlan {<vid>|none}
no switchport trunk native vlan

Parameter	Description
<vid>	The ID of the VLAN that will be used to classify the incoming untagged packets, in the range 2-2094. The VLAN ID must be a part of the VLAN member set of the port.
none	No native VLAN specified. This option removes the native VLAN from the port and sets the acceptable frame types to vlan-tagged only. Note: Use the no variant of this command to revert to the default VLAN 1 as the native VLAN for the specified interface switchport - not none .

Default VLAN 1 (the default VLAN), which is reverted to using the **no** form of this command.

Mode Interface Configuration

Examples To set the native VLAN on interface port1.0.2 to VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport trunk native vlan 2
```

To remove the native VLAN from interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport trunk native vlan none
```

To reset the native VLAN on interface port1.0.2 to the default VLAN 1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no switchport trunk native vlan
```

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

switchport vlan-stacking (double-tagging)

Overview Use this command to enable VLAN stacking on a port and set it to be a customer-edge-port or provider-port. This is sometimes referred to as VLAN double-tagging, nested VLANs, or Q in Q.

Use **no** parameter with this command to disable VLAN stacking on an interface.

The port must be in access mode.

Syntax switchport vlan-stacking {customer-edge-port|provider-port}
no switchport vlan-stacking

Parameter	Description
customer-edge-port	Set the port to be a customer edge port. This port must already be in access mode.
provider-port	Set the port to be a provider port. This port must already be in trunk mode.

Default By default, ports are not VLAN stacking ports.

Mode Interface Configuration

Usage Use VLAN stacking to separate traffic from different customers to that they can be managed over a provider network.

For more information about how to configure this feature, see the [VLAN Feature Overview and Configuration Guide](#).

Note that you must also enable jumbo frame support on the customer edge port, by using the [platform jumboframe](#) command.

Traffic with an extra VLAN header added by VLAN stacking cannot be routed.

Example To apply vlan-stacking to the selected port, configure it to be a customer edge port, and turn on jumbo frames, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport vlan-stacking customer-edge-port
awplus(config-if)# platform jumboframe
```


Related [platform jumboframe](#)
commands

switchport voice dscp

Overview Use this command for a specific port to configure the Layer 3 DSCP value advertised when the transmission of LLDP-MED Network Policy TLVs for voice devices is enabled. When LLDP-MED capable IP phones receive this network policy information, they transmit voice data with the specified DSCP value.

Use the **no** variant of this command to reset the DSCP value to the default, 0.

Syntax switchport voice dscp <0-63>
no switchport voice dscp

Parameter	Description
dscp	Specify a DSCP value for voice data.
<0-63>	DSCP value.

Default A DSCP value of 0 will be advertised.

Mode Interface Configuration

Usage notes LLDP-MED advertisements including Network Policy TLVs are transmitted via a port if:

- LLDP is enabled (**lldp run**)
- Voice VLAN is configured for the port (**switchport voice vlan**)
- The port is configured to transmit LLDP advertisements—enabled by default (**lldp transmit receive**)
- The port is configured to transmit Network Policy TLVs—enabled by default (**lldp med-tlv-select**)
- There is an LLDP-MED device connected to the port

Example To tell IP phones connected to port1.0.2 to send voice data with DSCP value 27, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport voice dscp 27
```

Related commands **lldp med-tlv-select**
show lldp
switchport voice vlan

switchport voice vlan

Overview Use this command to configure the Voice VLAN tagging advertised when the transmission of LLDP-MED Network Policy TLVs for voice endpoint devices is enabled. When LLDP-MED capable IP phones receive this network policy information, they transmit voice data with the specified tagging. This command also sets the ports to be spanning tree edge ports, that is, it enables spanning tree portfast on the ports.

Use the **no** variant of this command to remove LLDP-MED network policy configuration for voice devices connected to these ports. This does not change the spanning tree edge port status.

Syntax switchport voice vlan [<vid>|dot1p|dynamic|untagged]
no switchport voice vlan

Parameter	Description
<vid>	VLAN identifier, in the range 1 to 4094.
dot1p	The IP phone should send User Priority tagged packets, that is, packets in which the tag contains a User Priority value, and a VID of 0. (The User Priority tag is also known as the 802.1p priority tag, or the Class of Service (CoS) tag.)
dynamic	The VLAN ID with which the IP phone should send tagged packets will be assigned by RADIUS authentication.
untagged	The IP phone should send untagged packets.

Default By default, no Voice VLAN is configured, and therefore no network policy is advertised for voice devices.

Mode Interface Configuration

Usage notes LLDP-MED advertisements including Network Policy TLVs are transmitted via a port if:

- LLDP is enabled (**lldp run**)
- Voice VLAN is configured for the port using this command (**switchport voice vlan**)
- The port is configured to transmit LLDP advertisements—enabled by default (**lldp transmit receive**)
- The port is configured to transmit Network Policy TLVs—enabled by default (**lldp med-tlv-select**)
- There is an LLDP-MED device connected to the port.

To set the priority value to be advertised for tagged frames, use the **switchport voice vlan priority**.

If the Voice VLAN details are to be assigned by RADIUS, then the RADIUS server must be configured to send the attribute “Egress-VLANID (56)” or “Egress-VLAN-Name (58)” in the RADIUS Accept message when authenticating a phone attached to this port.

To set these attributes on the local RADIUS server, use the **egress-vlan-id (radsrv-grp)** or the **egress-vlan-name (radsrv-grp)**.

For more information about configuring authentication for Voice VLAN, see the **LLDP Feature Overview and Configuration Guide**.

If the ports have been set to be edge ports by the **switchport voice vlan** command, the **no** variant of this command will leave them unchanged as edge ports. To set them back to their default non-edge port configuration, use the **spanning-tree edgeport (RSTP and MSTP)**.

Examples To tell IP phones connected to port1.0.4 to send voice data tagged for VLAN 10, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# switchport voice vlan 10
```

To tell IP phones connected to port1.0.2-port1.0.8 to send priority tagged packets (802.1p priority tagged with VID 0, so that they will be assigned to the port VLAN) use the following commands. The priority value is 5 by default, but can be configured with the **switchport voice vlan priority** command.

```
awplus# configure terminal
awplus(config)# interface port1.0.2-port1.0.8
awplus(config-if)# switchport voice vlan dot1p
```

To dynamically configure the VLAN ID advertised to IP phones connected to port1.0.1 based on the VLAN assigned by RADIUS authentication (with RADIUS attribute "Egress- VLANID" or "Egress-VLAN-Name" in the RADIUS accept packet), use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# switchport voice vlan dynamic
```

To remove the Voice VLAN, and therefore disable the transmission of LLDP-MED network policy information for voice devices on port1.0.8, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.8
awplus(config-if)# no switchport voice vlan
```

Related commands **egress-vlan-id (radsrv-grp)**
egress-vlan-name (radsrv-grp)

lldp med-tlv-select

spanning-tree edgeport (RSTP and MSTP)

switchport voice dscp

switchport voice vlan priority

show lldp

switchport voice vlan priority

Overview Use this command to configure the Layer 2 user priority advertised when the transmission of LLDP-MED Network Policy TLVs for voice devices is enabled. This is the priority in the User Priority field of the IEEE 802.1Q VLAN tag, also known as the Class of Service (CoS), or 802.1p priority. When LLDP-MED capable IP phones receive this network policy information, they transmit voice data with the specified priority.

Syntax `switchport voice vlan priority <0-7>`
`no switchport voice vlan priority`

Parameter	Description
<code>priority</code>	Specify a user priority value for voice data.
<code><0-7></code>	Priority value.

Default By default, the Voice VLAN user priority value is 5.

Mode Interface Configuration

Usage LLDP-MED advertisements including Network Policy TLVs are transmitted via a port if:

- LLDP is enabled (**lldp run**)
- Voice VLAN is configured for the port (**switchport voice vlan**)
- The port is configured to transmit LLDP advertisements—enabled by default (**lldp transmit receive**)
- The port is configured to transmit Network Policy TLVs—enabled by default (**lldp med-tlv-select**)
- There is an LLDP-MED device connected to the port.

To set the Voice VLAN tagging to be advertised, use the **switchport voice vlan**.

Example To remove the Voice VLAN, and therefore disable the transmission of LLDP-MED network policy information for voice devices on port1.0.6, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.6
awplus(config-if)# no switchport voice vlan
```

Related commands **lldp med-tlv-select**
show lldp
switchport voice vlan

vlan

Overview This command creates VLANs, assigns names to them, and enables or disables them. Disabling the VLAN causes all forwarding over the specified VLAN ID to cease. Enabling the VLAN allows forwarding of frames on the specified VLAN.

You can create a management-only VLAN that contains only one member port and may be used as a remote management port. Management-only VLANs process packets in the CPU rather than in hardware. See the parameter table below for more detail.

If you need to control ingress and egress traffic to and from management interfaces, you can use software-based ACLs to filter traffic to and from a management-only VLAN.

The **no** variant of this command destroys the specified VLANs or returns their MTU to the default.

Syntax `vlan <vid> [name <vlan-name>] [state {enable|disable|management-only}]`
`vlan <vid-range> [state {enable|disable|management-only}]`
`vlan {<vid>|<vlan-name>} [mtu <mtu-value>]`
`no vlan {<vid>|<vid-range>} [mtu]`

Parameter	Description
<vid>	The VID of the VLAN to enable or disable, in the range 1-4094.
<vlan-name>	The ASCII name of the VLAN. Maximum length: 32 characters.
<vid-range>	Specifies a range of VLAN identifiers.
<mtu-value>	Specifies the Maximum Transmission Unit (MTU) size in bytes, in the range 68 to 1500 bytes, for the VLAN.
enable	Puts the VLAN into an enabled state.
disable	Puts the VLAN into a disabled state.
management-only	Management-only VLANs are VLANs which: • have one and only one access port (no aggregators, trunk port etc.) • do not route to/from other interfaces. • process packets in the CPU, rather than in hardware. • cannot be converted to a normal VLAN, nor can a normal VLAN be converted to a management-only VLAN. Delete and re-create the VLAN to convert a normal VLAN to/from a management-only VLAN.

Default By default, VLANs are enabled when they are created.

Mode VLAN Configuration

Examples To enable VLAN 45, use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 45 name accounts state enable
```

To destroy VLAN 45, use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# no vlan 45
```

To create a management-only VLAN with VID 100, use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 100 state management-only
```

Related commands **mtu**
vlan database
show vlan

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V
Version 5.4.9-2.1: Parameter **management-only** added

vlan access-map

Overview Use this command to create a VLAN access-map and enter into VLAN access-map mode, so you can add ACLs to the map. You can use any IPv4 or IPv6 hardware ACLs. VLAN access-maps are used to attach ACLs to VLANs, and therefore to filter traffic as it ingresses VLANs.

See the [ACL Feature Overview and Configuration Guide](#) for more information, including information about the number of rules consumed by per-VLAN ACLs, and ACL processing order.

Use the **no** variant of this command to delete a VLAN access-map.

Syntax `vlan access-map <name>`
`no vlan access-map <name>`

Parameter	Description
<name>	A name for the access-map.

Default By default, no VLAN access-maps exist.

Mode Global Configuration

Example To apply ACL 3001 to VLAN 48, where the ACL drops IP traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 3001 deny ip any any
awplus(config)# vlan access-map deny_all
awplus(config-vlan-access-map)# match access-group 3001
awplus(config-vlan-access-map)# exit
awplus(config)# vlan filter deny_all vlan-list 48 input
```

Related commands [match access-group](#)
[show vlan access-map](#)
[vlan filter](#)

Command changes Version 5.4.6-2.1: command added

vlan classifier activate

Overview Use this command in Interface Configuration mode to associate a VLAN classifier group with the switch port.

Use the **no** variant of this command to remove the VLAN classifier group from the switch port.

Syntax `vlan classifier activate <vlan-class-group-id>`
`no vlan classifier activate <vlan-class-group-id>`

Parameter	Description
<code><vlan-class-group-id></code>	Specify a VLAN classifier group identifier in the range <1-16>.

Mode Interface Configuration mode for a switch port or link aggregator.

Usage notes See the protocol-based VLAN configuration example in the [VLAN Feature Overview and Configuration Guide](#) for configuration details.

Example To associate VLAN classifier group 3 with switch port1.0.3, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# vlan classifier activate 3
```

To remove VLAN classifier group 3 from switch port1.0.3, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# no vlan classifier activate 3
```

Related commands

- [show vlan classifier rule](#)
- [vlan classifier group](#)
- [vlan classifier rule ipv4](#)
- [vlan classifier rule proto](#)

vlan classifier group

Overview Use this command to create a group of VLAN classifier rules. The rules must already have been created.

Use the **no** variant of this command to delete a group of VLAN classifier rules.

Syntax `vlan classifier group <1-16> {add|delete} rule <vlan-class-rule-id>`
`no vlan classifier group <1-16>`

Parameter	Description
<1-16>	VLAN classifier group identifier
add	Add the rule to the group.
delete	Delete the rule from the group.
<vlan-class-rule-id>	The VLAN classifier rule identifier.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# vlan classifier group 3 add rule 5`

Related commands [show vlan classifier rule](#)
[vlan classifier activate](#)
[vlan classifier rule ipv4](#)
[vlan classifier rule proto](#)

vlan classifier rule ipv4

Overview Use this command to create an IPv4 subnet-based VLAN classifier rule and map it to a specific VLAN. Use the **no** variant of this command to delete the VLAN classifier rule.

Syntax `vlan classifier rule <1-256> ipv4 <ip-addr/prefix-length>
vlan <1-4094>
no vlan classifier rule <1-256>`

Parameter	Description
<1-256>	Specify the VLAN Classifier Rule identifier.
<ip-addr/prefix-length>	Specify the IP address and prefix length.
<1-4094>	Specify a VLAN ID to which an untagged packet is mapped in the range <1-4094>.

Mode Global Configuration

Usage notes If the source IP address matches the IP subnet specified in the VLAN classifier rule, the received packets are mapped to the specified VLAN.

NOTE: The subnet VLAN classifier only matches IPv4 packets. It does not match ARP packets. To ensure ARP traffic is classified into the correct subnet VLAN, you can use a hardware based policy map that sends ARP packets to the CPU, which will then process them appropriately. This means that if you use subnet-based VLANs, you should also configure the following:

NOTE: The policy map should be applied to each port that uses a subnet based VLAN using the service-policy input command:

Example `awplus# configure terminal
awplus(config)# vlan classifier rule 3 ipv4 3.3.3.3/8 vlan 5`

Related commands [show vlan classifier rule](#)
[vlan classifier activate](#)
[vlan classifier rule proto](#)

vlan classifier rule proto

Overview Use this command to create a protocol type-based VLAN classifier rule, and map it to a specific VLAN. See the published IANA EtherType IEEE 802 numbers here:

www.iana.org/assignments/ieee-802-numbers/ieee-802-numbers.txt.

Instead of a protocol name the decimal value of the protocol's EtherType can be entered. The EtherType field is a two-octet field in an Ethernet frame. It is used to show which protocol is encapsulated in the payload of the Ethernet frame. Note that EtherTypes in the IANA 802 numbers are given as hexadecimal values.

The **no** variant of this command removes a previously set rule.

Syntax vlan classifier rule <1-256> proto <protocol> encaps {ethv2|
nosnapllc|snapllc} vlan <1-4094>
no vlan classifier rule <1-256>

Parameter	Description
<1-256>	VLAN Classifier identifier
proto	Protocol type
<protocol>	Specify a protocol either by its decimal number (0-65535) or by one of the following protocol names:
[arp|2054]	Address Resolution protocol
[atalkarp|33011]	Appletalk AARP protocol
[atalkddp|32923]	Appletalk DDP protocol
[atmmulti|34892]	MultiProtocol Over ATM protocol
[atmtransport|34948]	Frame-based ATM Transport protocol
[dec|24576]	DEC Assigned protocol
[deccustom|24582]	DEC Customer use protocol
[decdiagnostics|24581]	DEC Systems Comms Arch protocol
[decdnadumpload|24577]	DEC DNA Dump/Load protocol
[decdnaremoteconsole|24578]	DEC DNA Remote Console protocol
[decdnarouting|24579]	DEC DNA Routing protocol
[declat|24580]	DEC LAT protocol
[decsyscomm|24583]	DEC Systems Comms Arch protocol
[g8bpqx25|2303]	G8BPQ AX.25 protocol
[ieeeaddrtrans|2561]	Xerox IEEE802.3 PUP Address

Parameter	Description
[ieeepup|2560]	Xerox IEEE802.3 PUP protocol
[ip|2048]	IP protocol
[ipv6|34525]	IPv6 protocol
[ipx|33079]	IPX protocol
[netbeui|61680]	IBM NETBIOS/NETBEUI protocol
[netbeui|61681]	IBM NETBIOS/NETBEUI protocol
[pppdiscovery|34915]	PPPoE discovery protocol
[pppsession|34916]	PPPoE session protocol
[rarp|32821]	Reverse Address Resolution protocol
[x25|2056]	CCITT.25 protocol
[xeroxaddrtrans|513]	Xerox PUP Address Translation protocol
[xeroxpup|512]	Xerox PUP protocol
ethv2	Ethernet Version 2 encapsulation
nosnapllc	LLC without SNAP encapsulation
snapllc	LLC SNAP encapsulation
<1-4094>	Specify a VLAN ID to which an untagged packet is mapped in the range <1-4094>

Mode Global Configuration

Usage notes If the protocol type matches the protocol specified in the VLAN classifier rule, the received packets are mapped to the specified VLAN. Ethernet Frame Numbers may be entered in place of the protocol names listed. For a full list please refer to the IANA list online: www.iana.org/assignments/ieee-802-numbers/ieee-802-numbers.txt

Example awplus# configure terminal
awplus(config)# vlan classifier rule 1 proto x25 encaps ethv2
vlan 2
awplus(config)# vlan classifier rule 2 proto 512 encaps ethv2
vlan 2
awplus(config)# vlan classifier rule 3 proto 2056 encaps ethv2
vlan 2
awplus(config)# vlan classifier rule 4 proto 2054 encaps ethv2
vlan 2

**Validation
Output** awplus# show vlan classifier rule

```
vlan classifier rule 16 proto rarp encaps ethv2 vlan 2
vlan classifier rule 8 proto encaps ethv2 vlan 2
vlan classifier rule 4 proto arp encaps ethv2 vlan 2
vlan classifier rule 3 proto xeroxpup encaps ethv2 vlan 2
vlan classifier rule 2 proto ip encaps ethv2 vlan 2
vlan classifier rule 1 proto ipv6 encaps ethv2 vlan 2
```

**Related
commands** [show vlan classifier rule](#)
[vlan classifier activate](#)
[vlan classifier group](#)

vlan database

Overview Use this command to enter the VLAN Configuration mode. You can then add or delete a VLAN, or modify its values.

Syntax `vlan database`

Mode Global Configuration

Example In the following example, note the change to VLAN Configuration mode from Global Configuration mode:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)#
```

Related commands [vlan](#)

Command changes Version 5.5.3-1.1: Support for up to 1024 VLANs added to AR1050V
Version 5.5.0-1.3: Support for up to 5 VLANs added to AR1050V

vlan filter

Overview Use this command to apply a VLAN access-map to a list of VLANs. The switch uses the ACLs in the access-map to filter traffic ingressing those VLANs.

See the [ACL Feature Overview and Configuration Guide](#) for more information, including information about the number of rules consumed by per-VLAN ACLs, and ACL processing order.

Use the **no** variant of this command to remove the access-map filter from the listed VLANs.

Syntax `vlan filter <access-map-name> vlan-list <vid> input`
`no vlan filter <access-map-name> vlan-list <vid> input`

Parameter	Description
<code><access-map-name></code>	The name of the VLAN access-map to apply to the specified list of VLANs
<code>vlan-list <vid></code>	The list of VLANs to filter. You can specify a single VLAN (e.g. 49), a comma-separated list of VLANs (e.g. 49, 51), a hyphenated range of VLANs (e.g. 49-51), or a combination (e.g. 49,51-53)
<code>input</code>	Apply the filter to ingress traffic

Default By default, no VLAN filters exist.

Mode Global Configuration

Example To apply ACL 3001 to VLAN 48, where the ACL drops IP traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 3001 deny ip any any
awplus(config)# vlan access-map deny_all
awplus(config-vlan-access-map)# match access-group 3001
awplus(config-vlan-access-map)# exit
awplus(config)# vlan filter deny_all vlan-list 48 input
```

Related commands [match access-group](#)
[show vlan filter](#)
[vlan access-map](#)

Command changes Version 5.4.6-2.1: command added

15 Spanning Tree Commands

- Contents**
- **Introduction** on page 699
 - **clear spanning-tree statistics** on page 700
 - **clear spanning-tree detected protocols (RSTP and MSTP)** on page 701
 - **debug mstp (RSTP and STP)** on page 702
 - **instance priority (MSTP)** on page 706
 - **instance vlan (MSTP)** on page 708
 - **region (MSTP)** on page 710
 - **revision (MSTP)** on page 711
 - **show debugging mstp** on page 712
 - **show spanning-tree** on page 713
 - **show spanning-tree brief** on page 716
 - **show spanning-tree mst** on page 717
 - **show spanning-tree mst config** on page 718
 - **show spanning-tree mst detail** on page 719
 - **show spanning-tree mst detail interface** on page 721
 - **show spanning-tree mst instance** on page 723
 - **show spanning-tree mst instance interface** on page 724
 - **show spanning-tree mst interface** on page 725
 - **show spanning-tree statistics** on page 726
 - **show spanning-tree statistics instance** on page 728
 - **show spanning-tree statistics instance interface** on page 729
 - **show spanning-tree statistics interface** on page 731
 - **show spanning-tree vlan range-index** on page 734
 - **spanning-tree autoedge (RSTP and MSTP)** on page 735
 - **spanning-tree bpdu** on page 736
 - **spanning-tree cisco-interoperability (MSTP)** on page 738
 - **spanning-tree edgeport (RSTP and MSTP)** on page 739
 - **spanning-tree enable** on page 740
 - **spanning-tree errdisable-timeout enable** on page 742
 - **spanning-tree errdisable-timeout interval** on page 743
 - **spanning-tree force-version** on page 744
 - **spanning-tree forward-time** on page 745
 - **spanning-tree guard root** on page 747
 - **spanning-tree hello-time** on page 748
 - **spanning-tree link-type** on page 749
 - **spanning-tree max-age** on page 750

- **spanning-tree max-hops (MSTP)** on page 751
- **spanning-tree mode** on page 752
- **spanning-tree mst configuration** on page 753
- **spanning-tree mst instance** on page 754
- **spanning-tree mst instance path-cost** on page 756
- **spanning-tree mst instance priority** on page 758
- **spanning-tree mst instance restricted-role** on page 760
- **spanning-tree mst instance restricted-tcn** on page 762
- **spanning-tree path-cost** on page 764
- **spanning-tree portfast (STP)** on page 765
- **spanning-tree portfast bpdu-filter** on page 767
- **spanning-tree portfast bpdu-guard** on page 769
- **spanning-tree priority (bridge priority)** on page 771
- **spanning-tree priority (port priority)** on page 772
- **spanning-tree restricted-role** on page 773
- **spanning-tree restricted-tcn** on page 774
- **spanning-tree transmit-holdcount** on page 775
- **undebg mstp** on page 776

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure RSTP, STP or MSTP. For information about spanning trees, including configuration procedures, see the [STP Feature Overview and Configuration Guide](#).

clear spanning-tree statistics

Overview Use this command to clear all the STP BPDU (Bridge Protocol Data Unit) statistics.

Syntax clear spanning-tree statistics
clear spanning-tree statistics [instance <mstp-instance>]
clear spanning-tree statistics [interface <port> [instance <mstp-instance>]]

Parameter	Description
<port>	The port to clear STP BPDU statistics for. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).
<mstp-instance>	The MSTP instance (MSTI - Multiple Spanning Tree Instance) to clear MSTP BPDU statistics.

Mode User Exec and Privileged Exec

Usage notes Use this command with the **instance** parameter in MSTP mode. Specifying this command with the **interface** parameter only not the instance parameter will work in STP and RSTP mode.

Examples awplus# clear spanning-tree statistics
awplus# clear spanning-tree statistics instance 1
awplus# clear spanning-tree statistics interface port1.0.2
awplus# clear spanning-tree statistics interface port1.0.2
instance 1

clear spanning-tree detected protocols (RSTP and MSTP)

Overview Use this command to clear the detected protocols for a specific port, or all ports.

Use this command in RSTP or MSTP mode only.

Syntax `clear spanning-tree detected protocols [interface <port>]`

Parameter	Description
<port>	The port to clear detected protocols for. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Example `awplus# clear spanning-tree detected protocols`

debug mstp (RSTP and STP)

Overview Use this command to enable debugging for the configured spanning tree mode, and echo data to the console, at various levels. Note that although this command uses the keyword **mstp** it displays debugging output for RSTP and STP protocols as well the MSTP protocol.

Use the **no** variant of this command to disable spanning tree debugging.

Syntax

```
debug mstp {all|cli|protocol [detail]|timer [detail]}
debug mstp {packet {rx|tx} [decode] [interface <interface>]}
debug mstp {topology-change [interface <interface>]}
no debug mstp {all|cli|protocol [detail]|timer [detail]}
no debug mstp {packet {rx|tx} [decode] [interface <interface>]}
no debug mstp {topology-change [interface <interface>]}
```

Parameter	Description
all	Echoes all spanning tree debugging levels to the console.
cli	Echoes spanning tree commands to the console.
packet	Echoes spanning tree packets to the console.
rx	Received packets.
tx	Transmitted packets.
protocol	Echoes protocol changes to the console.
timer	Echoes timer information to the console.
detail	Detailed output.
decode	Interprets packet contents
topology-change	Interprets topology change messages
interface	Keyword before <interface> placeholder to specify an interface to debug
<interface>	Placeholder used to specify the name of the interface to debug.

Mode Privileged Exec and Global Configuration mode

Usage 1 Use the **debug mstp topology-change interface** command to generate debugging messages when the device receives an indication of a topology change in a BPDU from another device. The debugging can be activated on a per-port basis. Although this command uses the keyword **mstp**, it displays debugging output for RSTP and STP protocols as well as the MSTP protocol.

Due to the likely volume of output, these debug messages are best viewed using the **terminal monitor** before issuing the relevant **debug mstp** command. The default terminal monitor filter will select and display these messages. Alternatively, the messages can be directed to any of the other log outputs by adding a filter for the MSTP application using **log buffered (filter)**:

```
awplus# configure terminal
awplus(config)# log buffered program mstp
```

Output 1

```
awplus#terminal monitor
awplus#debug mstp topology-change interface port1.0.4
10:09:09 awplus MSTP[1409]: Topology change rcvd on port1.0.4 (internal)
10:09:09 awplus MSTP[1409]: Topology change rcvd on MSTI 1 port1.0.4
awplus#debug mstp topology-change interface port1.0.6
10:09:29 awplus MSTP[1409]: Topology change rcvd on port1.0.6 (external)
10:09:29 awplus MSTP[1409]: Topology change rcvd on MSTI 1 port1.0.6
```

Usage 2 Use the **debug mstp packet rx|tx decode interface** command to generate debugging messages containing the entire contents of a BPDU displayed in readable text for transmitted and received xSTP BPDUs. The debugging can be activated on a per-port basis and transmit and receive debugging is controlled independently. Although this command uses the keyword **mstp**, it displays debugging output for RSTP and STP protocols as well as the MSTP protocol.

Due to the likely volume of output, these debug messages are best viewed using the **terminal monitor** before issuing the relevant **debug mstp** command. The default terminal monitor filter will select and display these messages. Alternatively, the messages can be directed to any of the other log outputs by adding a filter for the MSTP application using the **log buffered (filter)**:

```
awplus(config)# log buffered program mstp
```

Output 2 In MSTP mode - an MSTP BPDU with 1 MSTI:

```
awplus#terminal monitor
awplus#debug mstp packet rx decode interface port1.0.4
17:23:42 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - start
17:23:42 awplus MSTP[1417]: Protocol version: MSTP, BPDU type: RST
17:23:42 awplus MSTP[1417]: CIST Flags: Agree Forward Learn role=Desig
17:23:42 awplus MSTP[1417]: CIST root id : 0000:0000cd1000fe
17:23:42 awplus MSTP[1417]: CIST ext pathcost : 0
17:23:42 awplus MSTP[1417]: CIST reg root id : 0000:0000cd1000fe
17:23:42 awplus MSTP[1417]: CIST port id : 8001 (128:1)
17:23:42 awplus MSTP[1417]: msg age: 0 max age: 20 hellotime: 2 fwd delay: 15
17:23:42 awplus MSTP[1417]: Version 3 length : 80
17:23:42 awplus MSTP[1417]: Format id : 0
17:23:42 awplus MSTP[1417]: Config name : test
17:23:42 awplus MSTP[1417]: Revision level : 0
17:23:42 awplus MSTP[1417]: Config digest : 3ab68794d602fdf43b21c0b37ac3bca8
17:23:42 awplus MSTP[1417]: CIST int pathcost : 0
17:23:42 awplus MSTP[1417]: CIST bridge id : 0000:0000cd1000fe
17:23:42 awplus MSTP[1417]: CIST hops remaining : 20
17:23:42 awplus MSTP[1417]: MSTI flags : Agree Forward Learn role=Desig
17:23:42 awplus MSTP[1417]: MSTI reg root id : 8001:0000cd1000fe
17:23:42 awplus MSTP[1417]: MSTI pathcost : 0
17:23:42 awplus MSTP[1417]: MSTI bridge priority : 32768 port priority : 128
17:23:42 awplus MSTP[1417]: MSTI hops remaining : 20
17:23:42 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - finish
```

In STP mode transmitting a TCN BPDU:

```
awplus#terminal monitor
awplus#debug mstp packet tx decode interface port1.0.4
17:28:09 awplus MSTP[1417]: port1.0.4 xSTP BPDU tx - start
17:28:09 awplus MSTP[1417]: Protocol version: STP, BPDU type: TCN
17:28:09 awplus MSTP[1417]: port1.0.4 xSTP BPDU tx - finish
```

In STP mode receiving an STP BPDU:

```
awplus#terminal monitor
awplus#debug mstp packet rx decode interface port1.0.4
17:31:36 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - start
17:31:36 awplus MSTP[1417]: Protocol version: STP, BPDU type: Config
17:31:36 awplus MSTP[1417]: Flags: role=none
17:31:36 awplus MSTP[1417]: Root id : 8000:0000cd1000fe
17:31:36 awplus MSTP[1417]: Root pathcost : 0
17:31:36 awplus MSTP[1417]: Bridge id : 8000:0000cd1000fe
17:31:36 awplus MSTP[1417]: Port id : 8001 (128:1)
17:31:36 awplus MSTP[1417]: msg age: 0 max age: 20 hellotime: 2 fwd delay: 15
17:31:36 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - finish
```

In RSTP mode receiving an RSTP BPDU:

```
awplus#terminal monitor
awplus#debug mstp packet rx decode interface port1.0.4
awplus#17:30:17 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - start
17:30:17 awplus MSTP[1417]: Protocol version: RSTP, BPDU type: RST
17:30:17 awplus MSTP[1417]: CIST Flags: Forward Learn role=Desig
17:30:17 awplus MSTP[1417]: CIST root id : 8000:0000cd1000fe
17:30:17 awplus MSTP[1417]: CIST ext pathcost : 0
17:30:17 awplus MSTP[1417]: CIST reg root id : 8000:0000cd1000fe
17:30:17 awplus MSTP[1417]: CIST port id : 8001 (128:1)
17:30:17 awplus MSTP[1417]: msg age: 0 max age: 20 hellotime: 2 fwd delay: 15
17:30:17 awplus MSTP[1417]: port1.0.4 xSTP BPDU rx - finish
```

Examples awplus# debug mstp all
awplus# debug mstp cli
awplus# debug mstp packet rx
awplus# debug mstp protocol detail
awplus# debug mstp timer
awplus# debug mstp packet rx decode interface port1.0.2
awplus# debug mstp packet tx decode interface port1.0.6

Related commands [log buffered \(filter\)](#)
[show debugging mstp](#)
[terminal monitor](#)
[undebug mstp](#)

instance priority (MSTP)

Overview Use this command to set the priority for this device to become the root bridge for the specified MSTI (Multiple Spanning Tree Instance).

Use this command for MSTP only.

Use the **no** variant of this command to restore the root bridge priority of the device for the instance to the default.

Syntax `instance <instance-id> priority <priority>`
`no instance <instance-id> priority`

Parameter	Description
<code><instance-id></code>	Specify an MSTP instance in the range 1-15.
<code><priority></code>	Specify the root bridge priority for the device for the MSTI in the range <0 - 61440>. Note that a lower priority number indicates a greater likelihood of the device becoming the root bridge. The priority values can be set only in increments of 4096. If you specify a number that is not a multiple of 4096, it will be rounded down. The default priority is 32768.

Default The default priority value for all instances is 32768.

Mode MST Configuration

Usage notes MSTP lets you distribute traffic more efficiently across a network by blocking different links for different VLANs. You do this by making different devices into the root bridge for each MSTP instance, so that each instance blocks a different link.

If all devices have the same root bridge priority for the instance, MSTP selects the device with the lowest MAC address to be the root bridge. Give the device a higher priority for becoming the root bridge for a particular instance by assigning it a lower priority number, or vice versa.

Examples To set the root bridge priority for MSTP instance 2 to be the highest (0), so that it will be the root bridge for this instance when available, use the commands:

```
awplus# configure terminal
awplus(config)# spanning-tree mst configuration
awplus(config-mst)# instance 2 priority 0
```

To reset the root bridge priority for instance 2 to the default (32768), use the commands:

```
awplus# configure terminal
awplus(config)# spanning-tree mst configuration
awplus(config-mst)# no instance 2 priority
```

Related commands

- region (MSTP)**
- revision (MSTP)**
- show spanning-tree mst config**
- spanning-tree mst instance**
- spanning-tree mst instance priority**

instance vlan (MSTP)

Overview Use this command to create an MST Instance (MSTI), and associate the specified VLANs with it. An MSTI is a spanning tree instance that exists within an MST region (MSTR).

When a VLAN is associated with an MSTI the member ports of the VLAN are automatically configured to send and receive spanning-tree information for the associated MSTI. You can disable this automatic configuration of member ports of the VLAN to the associated MSTI by using a **no spanning-tree mst instance** command to remove the member port from the MSTI.

Use the **instance vlan** command for MSTP only.

Use the **no** variant of this command to remove the specified VLANs from the MSTI.

Syntax `instance <instance-id> vlan <vid-list>`
`no instance <instance-id> vlan <vid-list>`

Parameter	Description
<code><instance-id></code>	Specify an MSTP instance in the range 1-15.
<code><vid-list></code>	Specify one or more VLAN identifiers (VID) to be associated with the MSTI specified. This can be a single VID in the range 1-4094, or a hyphen-separated range or a comma-separated list of VLAN IDs.

Mode MST Configuration

Usage notes The VLANs must be created before being associated with an MST instance (MSTI). If the VLAN range is not specified, the MSTI will not be created.

This command removes the specified VLANs from the CIST and adds them to the specified MSTI. If you use the **no** variant of this command to remove the VLAN from the MSTI, it returns it to the CIST. To move a VLAN from one MSTI to another, you must first use the **no** variant of this command to return it to the CIST.

Ports in these VLANs will remain in the control of the CIST until you associate the ports with the MSTI using the **spanning-tree mst instance** command.

Example To associate VLAN 30 with MSTI 2, use the commands:

```
awplus# configure terminal
awplus(config)# spanning-tree mode mstp
awplus(config)# spanning-tree mst configuration
awplus(config-mst)# instance 2 vlan 30
```

Related commands

- region (MSTP)**
- revision (MSTP)**
- show spanning-tree mst config**
- spanning-tree mst instance**
- vlan**

region (MSTP)

Overview Use this command to assign a name to the device's MST Region. MST Instances (MSTI) of a region form different spanning trees for different VLANs.

Use this command for MSTP only.

Use the **no** variant of this command to remove this region name and reset it to the default.

Syntax `region <region-name>`
`no region`

Parameter	Description
<code><region-name></code>	Specify the name of the region, up to 32 characters. Valid characters are upper-case, lower-case, digits, underscore.

Default By default, the region name is My Name.

Mode MST Configuration

Usage The region name, the revision number, and the digest of the VLAN to MSTI configuration table must be the same on all devices that are intended to be in the same MST region.

Example

```
awplus# configure terminal
awplus(config)# spanning-tree mst configuration
awplus(config-mst)# region ATL
```

Related commands [revision \(MSTP\)](#)
[show spanning-tree mst config](#)

revision (MSTP)

Overview Use this command to specify the MST revision number to be used in the configuration identifier.

Use this command for MSTP only.

Syntax `revision <revision-number>`

Parameter	Description
<code><revision-number></code>	<code><0-65535></code> Revision number.

Default The default of revision number is 0.

Mode MST Configuration

Usage The region name, the revision number, and the digest of the VLAN to MSTI configuration table must be the same on all devices that are intended to be in the same MST region.

Example

```
awplus# configure terminal
awplus(config)# spanning-tree mst configuration
awplus(config-mst)# revision 25
```

Related commands

- [region \(MSTP\)](#)
- [show spanning-tree mst config](#)
- [instance vlan \(MSTP\)](#)

show debugging mstp

Overview Use this command to see what debugging is turned on for MSTP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging mstp

Mode User Exec and Privileged Exec

Example To display the MSTP debugging options set, enter the command:
awplus# show debugging mstp

Output The following shows typical output.

Example output from show debugging mstp

```
MSTP debugging status:
MSTP receiving packet debugging is on
```

Related commands [debug mstp \(RSTP and STP\)](#)

show spanning-tree

Overview Use this command to display detailed spanning tree information on the specified port or on all ports. Use this command for RSTP, MSTP or STP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree [interface *<port-list>*]

Parameter	Description
interface	Display information about the following port only.
<i><port-list></i>	The ports to display information about. A port-list can be: • a switch port (e.g. port1.0.6) a static channel group (e.g. sa2) or a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen, e.g. port1.0.1-1.0.4, or sa1-2, or po1-2 • a comma-separated list of ports and port ranges, e.g. port1.0.1,port1.0.4-1.0.6. Do not mix switch ports, static channel groups, and dynamic (LACP) channel groups in the same list

Mode User Exec and Privileged Exec

Usage notes Note that any list of interfaces specified must not span any interfaces that are not installed.

A topology change counter has been included for RSTP and MSTP. You can see the topology change counter for RSTP by using the **show spanning-tree** command. You can see the topology change counter for MSTP by using the **show spanning-tree mst instance** command.

Example To display spanning tree information about port1.0.3, use the command:
awplus# show spanning-tree interface port1.0.3

Output The following shows typical output.

Example output from show spanning-tree in RSTP mode

```
awplus#show spanning-tree
% 1: Bridge up - Spanning Tree Enabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: Root Id 80000000cd24ff2d
% 1: Bridge Id 80000000cd24ff2d
% 1: last topology change Mon Oct 3 02:06:26 2016
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
% port1.0.1: Port 5001 - Id 8389 - Role Disabled - State Discarding
% port1.0.1: Designated Path Cost 0
% port1.0.1: Configured Path Cost 20000000 - Add type Explicit ref count 1
% port1.0.1: Designated Port Id 8389 - Priority 128 -
% port1.0.1: Root 80000000cd24ff2d
% port1.0.1: Designated Bridge 80000000cd24ff2d
% port1.0.1: Message Age 0 - Max Age 20
% port1.0.1: Hello Time 2 - Forward Delay 15
% port1.0.1: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change
timer 0
% port1.0.1: forward-transitions 0
% port1.0.1: Version Rapid Spanning Tree Protocol - Received None - Send STP
% port1.0.1: No portfast configured - Current portfast off
% port1.0.1: portfast bpdu-guard default - Current portfast bpdu-guard off
% port1.0.1: portfast bpdu-filter default - Current portfast bpdu-filter off
% port1.0.1: no root guard configured - Current root guard off
% port1.0.1: Configured Link Type point-to-point - Current shared
%
% port1.0.2: Port 5002 - Id 838a - Role Disabled - State Discarding
% port1.0.2: Designated Path Cost 0
% port1.0.2: Configured Path Cost 20000000 - Add type Explicit ref count 1
% port1.0.2: Designated Port Id 838a - Priority 128 -
% port1.0.2: Root 80000000cd24ff2d
% port1.0.2: Designated Bridge 80000000cd24ff2d
% port1.0.2: Message Age 0 - Max Age 20
% port1.0.2: Hello Time 2 - Forward Delay 15
% port1.0.2: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change
timer 0
% port1.0.2: forward-transitions 0
% port1.0.2: Version Rapid Spanning Tree Protocol - Received None - Send STP
% port1.0.2: No portfast configured - Current portfast off
% port1.0.2: portfast bpdu-guard default - Current portfast bpdu-guard off
% port1.0.2: portfast bpdu-filter default - Current portfast bpdu-filter off
% port1.0.2: no root guard configured - Current root guard off
% port1.0.2: Configured Link Type point-to-point - Current shared
```

Output The following shows typical output.

Example output from show spanning-tree

```
% 1: Bridge up - Spanning Tree Enabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: Root Id 80000000cd20f093
% 1: Bridge Id 80000000cd20f093
% 1: last topology change Mon Oct 3 02:06:26 2016
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
%   port1.0.3: Port 5023 - Id 839f - Role Designated - State Forwarding
%   port1.0.3: Designated Path Cost 0
%   port1.0.3: Configured Path Cost 200000 - Add type Explicit ref count 1
%   port1.0.3: Designated Port Id 839f - Priority 128 -
%   port1.0.3: Root 80000000cd20f093
%   port1.0.3: Designated Bridge 80000000cd20f093
%   port1.0.3: Message Age 0 - Max Age 20
%   port1.0.3: Hello Time 2 - Forward Delay 15
%   port1.0.3: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 1 - topo change
timer 0
%   port1.0.3: forward-transitions 32
%   port1.0.3: Version Rapid Spanning Tree Protocol - Received None - Send RSTP
%   port1.0.3: No portfast configured - Current portfast off
%   port1.0.3: portfast bpdu-guard default - Current portfast bpdu-guard off
%   port1.0.3: portfast bpdu-filter default - Current portfast bpdu-filter off
%   port1.0.3: no root guard configured - Current root guard off
%   port1.0.3: Configured Link Type point-to-point - Current point-to-point
...
```

show spanning-tree brief

Overview Use this command to display a summary of spanning tree status information on all ports. Use this command for RSTP, MSTP or STP.

Syntax show spanning-tree brief

Parameter	Description
brief	A brief summary of spanning tree information.

Mode User Exec and Privileged Exec

Usage notes Note that any list of interfaces specified must not span any interfaces that are not installed.

A topology change counter has been included for RSTP and MSTP. You can see the topology change counter for RSTP by using the **show spanning-tree** command. You can see the topology change counter for MSTP by using the **show spanning-tree mst instance** command.

Example To display a summary of spanning tree status information, use the command:

```
awplus# show spanning-tree brief
```

Output The following shows typical output.

Example output from show spanning-tree brief

```
Default: Bridge up - Spanning Tree Enabled
Default: Root Path Cost 40000 - Root Port 4501 - Bridge Priority 32768
Default: Root Id 8000:0000cd250001
Default: Bridge Id 8000:0000cd296eb1
```

Port	Designated Bridge	Port Id	Role	State
sa1	8000:001577c9744b	8195	Rootport	Forwarding
po1	8000:0000cd296eb1	81f9	Designated	Forwarding
port1.0.1	8000:0000cd296eb1	8389	Disabled	Discarding
port1.0.2	8000:0000cd296eb1	838a	Disabled	Discarding
port1.0.3	8000:0000cd296eb1	838b	Disabled	Discarding
...				

Related commands [show spanning-tree](#)

show spanning-tree mst

Overview This command displays bridge-level information about the CIST and VLAN to MSTI mappings.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree mst

Mode User Exec, Privileged Exec and Interface Configuration

Example To display bridge-level information about the CIST and VLAN to MSTI mappings, enter the command:

```
awplus# show spanning-tree mst
```

Output The following shows typical output.

Example output from show spanning-tree mst

```
% 1: Bridge up - Spanning Tree Enabled
% 1: CIST Root Path Cost 0 - CIST Root Port 0 - CIST Bridge
Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
% 1: CIST Root Id 8000000475e93ffe
% 1: CIST Reg Root Id 8000000475e93ffe
% 1: CST Bridge Id 8000000475e93ffe
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
%
% Instance      VLAN
% 0:            1
% 2:            4
```

Related commands [show spanning-tree mst interface](#)

show spanning-tree mst config

Overview Use this command to display MSTP configuration identifier for the device.

Syntax show spanning-tree mst config

Mode User Exec, Privileged Exec and Interface Configuration

Usage notes The region name, the revision number, and the digest of the VLAN to MSTI configuration table must be the same on all devices that are intended to be in the same MST region.

Example To display MSTP configuration identifier information, enter the command:
awplus# show spanning-tree mst config

Output The following shows typical output.

Example output from show spanning-tree mst config

```
awplus#show spanning-tree mst config
%
%  MSTP Configuration Information:
%-----
%  Format Id      : 0
%  Name           : My Name
%  Revision Level : 0
%  Digest         : 0x80DEE46DA92A98CF21C603291B22880A
%-----
```

Related commands [instance vlan \(MSTP\)](#)
[region \(MSTP\)](#)
[revision \(MSTP\)](#)

show spanning-tree mst detail

Overview This command displays detailed information about each instance, and all interfaces associated with that particular instance.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree mst detail

Mode User Exec, Privileged Exec and Interface Configuration

Example To display detailed information about each instance, and all interfaces associated with them, enter the command:

```
awplus# show spanning-tree mst detail
```

Output The following shows typical output.

Example output from show spanning-tree mst detail

```
% 1: Bridge up - Spanning Tree Enabled
% 1: CIST Root Path Cost 0 - CIST Root Port 0 - CIST Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
% 1: CIST Root Id 80000000cd24ff2d
% 1: CIST Reg Root Id 80000000cd24ff2d
% 1: CIST Bridge Id 80000000cd24ff2d
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
% port1.0.1: Port 5001 - Id 8389 - Role Disabled - State Discarding
% port1.0.1: Designated External Path Cost 0 -Internal Path Cost 0
% port1.0.1: Configured Path Cost 20000000 - Add type Explicit ref count 1
% port1.0.1: Designated Port Id 8389 - CIST Priority 128 -
% port1.0.1: CIST Root 80000000cd24ff2d
% port1.0.1: Regional Root 80000000cd24ff2d
% port1.0.1: Designated Bridge 80000000cd24ff2d
% port1.0.1: Message Age 0 - Max Age 20
% port1.0.1: CIST Hello Time 2 - Forward Delay 15
% port1.0.1: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo
change timer 0

...
% port1.0.2: forward-transitions 0
% port1.0.2: Version Multiple Spanning Tree Protocol - Received None - Send STP
% port1.0.2: No portfast configured - Current portfast off
% port1.0.2: portfast bpdu-guard default - Current portfast bpdu-guard off
% port1.0.2: portfast bpdu-filter default - Current portfast bpdu-filter off
% port1.0.2: no root guard configured - Current root guard off
% port1.0.2: Configured Link Type point-to-point - Current shared

% port1.0.3: Port 5003 - Id 838b - Role Disabled - State Discarding
% port1.0.3: Designated External Path Cost 0 -Internal Path Cost 0
% port1.0.3: Configured Path Cost 20000000 - Add type Explicit ref count 1
% port1.0.3: Designated Port Id 838b - CIST Priority 128 -
% port1.0.3: CIST Root 80000000cd24ff2d
% port1.0.3: Regional Root 80000000cd24ff2d
% port1.0.3: Designated Bridge 80000000cd24ff2d
% port1.0.3: Message Age 0 - Max Age 20
% port1.0.3: CIST Hello Time 2 - Forward Delay 15
% port1.0.3: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo
change timer 0
% port1.0.3: forward-transitions 0
% port1.0.3: Version Multiple Spanning Tree Protocol - Received None - Send STP
% port1.0.3: No portfast configured - Current portfast off
% port1.0.3: portfast bpdu-guard default - Current portfast bpdu-guard off
% port1.0.3: portfast bpdu-filter default - Current portfast bpdu-filter off
% port1.0.3: no root guard configured - Current root guard off
% port1.0.3: Configured Link Type point-to-point - Current shared
```

show spanning-tree mst detail interface

Overview This command displays detailed information about the specified switch port, and the MST instances associated with it.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree mst detail interface *<port>*

Parameter	Description
<i><port></i>	The port to display information about. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode User Exec, Privileged Exec and Interface Configuration

Example To display detailed information about port1.0.3 and the instances associated with it, enter the command:

```
awplus# show spanning-tree mst detail interface port1.0.3
```

Output The following shows typical output.

Example output from show spanning-tree mst detail interface

```
% 1: Bridge up - Spanning Tree Enabled
% 1: CIST Root Path Cost 0 - CIST Root Port 0 - CIST Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
% 1: CIST Root Id 80000000cd24ff2d
% 1: CIST Reg Root Id 80000000cd24ff2d
% 1: CIST Bridge Id 80000000cd24ff2d
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
% port1.0.2: Port 5002 - Id 838a - Role Disabled - State Discarding
% port1.0.2: Designated External Path Cost 0 -Internal Path Cost 0
% port1.0.2: Configured Path Cost 20000000 - Add type Explicit ref count 2
% port1.0.2: Designated Port Id 838a - CIST Priority 128 -
% port1.0.2: CIST Root 80000000cd24ff2d
% port1.0.2: Regional Root 80000000cd24ff2d
% port1.0.2: Designated Bridge 80000000cd24ff2d
% port1.0.2: Message Age 0 - Max Age 20
% port1.0.2: CIST Hello Time 2 - Forward Delay 15
% port1.0.2: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo
change timer 0
% port1.0.2: forward-transitions 0
% port1.0.2: Version Multiple Spanning Tree Protocol - Received None - Send STP

% port1.0.2: No portfast configured - Current portfast off
% port1.0.2: portfast bpdu-guard default - Current portfast bpdu-guard off
% port1.0.2: portfast bpdu-filter default - Current portfast bpdu-filter off
% port1.0.2: no root guard configured - Current root guard off
% port1.0.2: Configured Link Type point-to-point - Current shared
%
% Instance 2: Vlan: 2
% 1: MSTI Root Path Cost 0 -MSTI Root Port 0 - MSTI Bridge Priority 32768
% 1: MSTI Root Id 80020000cd24ff2d
% 1: MSTI Bridge Id 80020000cd24ff2d
% port1.0.2: Port 5002 - Id 838a - Role Disabled - State Discarding
% port1.0.2: Designated Internal Path Cost 0 - Designated Port Id 838a
% port1.0.2: Configured Internal Path Cost 20000000
% port1.0.2: Configured CST External Path cost 20000000
% port1.0.2: CST Priority 128 - MSTI Priority 128
% port1.0.2: Designated Root 80020000cd24ff2d
% port1.0.2: Designated Bridge 80020000cd24ff2d
% port1.0.2: Message Age 0 - Max Age 0
% port1.0.2: Hello Time 2 - Forward Delay 15
% port1.0.2: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0
```

show spanning-tree mst instance

Overview This command displays detailed information for the specified instance, and all switch ports associated with that instance.

A topology change counter has been included for RSTP and MSTP. You can see the topology change counter for RSTP by using the **show spanning-tree** command. You can see the topology change counter for MSTP by using the **show spanning-tree mst instance** command.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show spanning-tree mst instance <instance-id>

Parameter	Description
<instance-id>	Specify an MSTP instance in the range 1-15.

Mode User Exec, Privileged Exec, and Interface Configuration

Example To display detailed information for **instance 2**, and all switch ports associated with that instance, use the command:

```
awplus# show spanning-tree mst instance 2
```

Output The following shows typical output.

Example output from show spanning-tree mst instance

```
% 1: MSTI Root Path Cost 0 - MSTI Root Port 0 - MSTI Bridge Priority 32768
% 1: MSTI Root Id 80020000cd24ff2d
% 1: MSTI Bridge Id 80020000cd24ff2d
% port1.0.2: Port 5002 - Id 838a - Role Disabled - State Discarding
% port1.0.2: Designated Internal Path Cost 0 - Designated Port Id 838a
% port1.0.2: Configured Internal Path Cost 20000000
% port1.0.2: Configured CST External Path cost 20000000
% port1.0.2: CST Priority 128 - MSTI Priority 128
% port1.0.2: Designated Root 80020000cd24ff2d
% port1.0.2: Designated Bridge 80020000cd24ff2d
% port1.0.2: Message Age 0 - Max Age 0
% port1.0.2: Hello Time 2 - Forward Delay 15
% port1.0.2: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0
%
```

show spanning-tree mst instance interface

Overview This command displays detailed information for the specified MST (Multiple Spanning Tree) instance, and the specified switch port associated with that MST instance.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree mst instance *<instance-id>* interface *<port>*

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15.
<i><port></i>	The port to display information about. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode User Exec, Privileged Exec, and Interface Configuration

Example To display detailed information for instance 2, interface port1.0.2, use the command:

```
awplus# show spanning-tree mst instance 2 interface port1.0.2
```

Output The following shows typical output.

Example output from show spanning-tree mst instance

```
% 1: MSTI Root Path Cost 0 - MSTI Root Port 0 - MSTI Bridge Priority 32768
% 1: MSTI Root Id 80020000cd24ff2d
% 1: MSTI Bridge Id 80020000cd24ff2d
% port1.0.2: Port 5002 - Id 838a - Role Disabled - State Discarding
% port1.0.2: Designated Internal Path Cost 0 - Designated Port Id 838a
% port1.0.2: Configured Internal Path Cost 20000000
% port1.0.2: Configured CST External Path cost 20000000
% port1.0.2: CST Priority 128 - MSTI Priority 128
% port1.0.2: Designated Root 80020000cd24ff2d
% port1.0.2: Designated Bridge 80020000cd24ff2d
% port1.0.2: Message Age 0 - Max Age 0
% port1.0.2: Hello Time 2 - Forward Delay 15
% port1.0.2: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0
%
```


show spanning-tree mst interface

Overview This command displays the number of instances created, and VLANs associated with it for the specified switch port.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree mst interface <port>

Parameter	Description
<port>	The port to display information about. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode User Exec, Privileged Exec, and Interface Configuration

Example To display detailed information about each instance, and all interfaces associated with them, for port1.0.4, use the command:

```
awplus# show spanning-tree mst interface port1.0.4
```

Output The following shows typical output.

Example output from show spanning-tree mst interface

```
% 1: Bridge up - Spanning Tree Enabled
% 1: CIST Root Path Cost 0 - CIST Root Port 0 - CIST Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
% 1: CIST Root Id 80000008c73a2b22
% 1: CIST Reg Root Id 80000008c73a2b22
% 1: CST Bridge Id 80000008c73a2b22
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 1 sec
%
% Instance      VLAN
% 0:           1
% 1:           2-3
% 2:           4-5
```

show spanning-tree statistics

Overview This command displays BPDU (Bridge Protocol Data Unit) statistics for all spanning-tree instances, and all switch ports associated with all spanning-tree instances.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree statistics

Mode Privileged Exec

Usage notes To display BPDU statistics for all spanning-tree instances, and all switch ports associated with all spanning-tree instances, use the command:

```
awplus# show spanning-tree statistics
```

Output The following shows typical output.

Example output from show spanning-tree statistics

```
Port number = 915 Interface = port1.0.6

=====
% BPDU Related Parameters
% -----
% Port Spanning Tree                : Disable
% Spanning Tree Type                : Rapid Spanning Tree Protocol
% Current Port State                 : Discarding
% Port ID                           : 8393
% Port Number                       : 393
% Path Cost                         : 20000000
% Message Age                       : 0
% Designated Root                   : ec:cd:6d:20:c0:ed
% Designated Cost                   : 0
% Designated Bridge                  : ec:cd:6d:20:c0:ed
% Designated Port Id                : 8393
% Top Change Ack                    : FALSE
% Config Pending                    : FALSE

% PORT Based Information & Statistics
% -----
% Config Bpdu's xmitted              : 0
% Config Bpdu's received             : 0
% TCN Bpdu's xmitted                 : 0
% TCN Bpdu's received               : 0
% Forward Trans Count                : 0

% STATUS of Port Timers
% -----
% Hello Time Configured              : 2
% Hello timer                        : INACTIVE
% Hello Time Value                   : 0
% Forward Delay Timer                : INACTIVE
% Forward Delay Timer Value          : 0
% Message Age Timer                  : INACTIVE
% Message Age Timer Value            : 0
% Topology Change Timer              : INACTIVE
% Topology Change Timer Value        : 0
% Hold Timer                         : INACTIVE
% Hold Timer Value                   : 0

% Other Port-Specific Info
% -----
% Max Age Transitions                : 1
% Msg Age Expiry                     : 0
% Similar BPDUS Rcvd                 : 0
% Src Mac Count                      : 0
% Total Src Mac Rcvd                 : 0
% Next State                         : Learning
% Topology Change Time               : 0
```

show spanning-tree statistics instance

Overview This command displays BPDU (Bridge Protocol Data Unit) statistics for the specified MST (Multiple Spanning Tree) instance, and all switch ports associated with that MST instance.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree statistics instance *<instance-id>*

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15.

Mode Privileged Exec

Example To display BPDU statistics information for MST instance 2, and all switch ports associated with that MST instance, use the command:

```
awplus# show spanning-tree statistics instance 2
```

Output The following shows typical output.

Example output from show spanning-tree statistics instance

```
% % INST_PORT port1.0.3 Information & Statistics
% -----
% Config Bpdu's xmitted (port/inst) : (0/0)
% Config Bpdu's received (port/inst) : (0/0)
% TCN Bpdu's xmitted (port/inst) : (0/0)
% TCN Bpdu's received (port/inst) : (0/0)
% Message Age(port/Inst) : (0/0)
% port1.0.3: Forward Transitions : 0
% Next State : Learning
% Topology Change Time : 0
...
```

Related commands [show spanning-tree statistics](#)

show spanning-tree statistics instance interface

Overview This command displays BPDU (Bridge Protocol Data Unit) statistics for the specified MST (Multiple Spanning Tree) instance and the specified switch port associated with that MST instance.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show spanning-tree statistics instance <instance-id> interface <port>`

Parameter	Description
<instance-id>	Specify an MSTP instance in the range 1-15.
<port>	The port to display information about. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Example To display BPDU statistics for MST instance 2, interface port1.0.2, use the command:

```
awplus# show spanning-tree statistics instance 2 interface  
port1.0.2
```

Output The following shows typical output.

Example output from show spanning-tree statistics instance interface

```
awplus#sh spanning-tree statistics interface port1.0.2 instance 1
Spanning Tree Enabled for Instance : 1
=====
% INST_PORT port1.0.2 Information & Statistics
% -----
% Config Bpdu's xmitted (port/inst)      : (0/0)
% Config Bpdu's received (port/inst)     : (0/0)
% TCN Bpdu's xmitted (port/inst)         : (0/0)
% TCN Bpdu's received (port/inst)        : (0/0)
% Message Age(port/Inst)                 : (0/0)
% port1.0.2: Forward Transitions         : 0
% Next State                             : Learning
% Topology Change Time                   : 0

% Other Inst/Vlan Information & Statistics
% -----
% Bridge Priority                         : 0
% Bridge Mac Address                     : ec:cd:6d:20:c0:ed
% Topology Change Initiator              : 5023
% Last Topology Change Occured           : Mon Oct 3 05:42:06 2016
% Topology Change                        : FALSE
% Topology Change Detected               : FALSE
% Topology Change Count                  : 1
% Topology Change Last Recvd from        : 00:00:00:00:00:00
```

Related commands [show spanning-tree statistics](#)

show spanning-tree statistics interface

Overview This command displays BPDU (Bridge Protocol Data Unit) statistics for the specified switch port, and all MST instances associated with that switch port.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show spanning-tree statistics interface *<port>*

Parameter	Description
<i><port></i>	The port to display information about. The port may be a switch port (e.g. port1.0.2), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Privileged Exec

Example To display BPDU statistics about each MST instance for port1.0.2, use the command:

```
awplus# show spanning-tree statistics interface port1.0.2
```

Output The following shows typical output.

Example output from show spanning-tree statistics interface

```
awplus#show spanning-tree statistics interface port1.0.2

      Port number = 906 Interface = port1.0.2

      =====
% BPDU Related Parameters
% -----
% Port Spanning Tree           : Disable
% Spanning Tree Type          : Multiple Spanning Tree Protocol
% Current Port State           : Discarding
% Port ID                      : 838a
% Port Number                  : 38a
% Path Cost                    : 20000000
% Message Age                  : 0
% Designated Root              : ec:cd:6d:20:c0:ed
% Designated Cost              : 0
% Designated Bridge            : ec:cd:6d:20:c0:ed
% Designated Port Id           : 838a
% Top Change Ack               : FALSE
% Config Pending               : FALSE

% PORT Based Information & Statistics
% -----
% Config Bpdu's xmitted        : 0
% Config Bpdu's received       : 0
% TCN Bpdu's xmitted           : 0
% TCN Bpdu's received          : 0
% Forward Trans Count          : 0

% STATUS of Port Timers
% -----
% Hello Time Configured        : 2
% Hello timer                   : INACTIVE
% Hello Time Value              : 0
% Forward Delay Timer           : INACTIVE
% Forward Delay Timer Value     : 0
% Message Age Timer             : INACTIVE
% Message Age Timer Value       : 0
% Topology Change Timer         : INACTIVE
% Topology Change Timer Value   : 0
% Hold Timer                    : INACTIVE
% Hold Timer Value              : 0

% Other Port-Specific Info
% -----
% Max Age Transitions           : 1
% Msg Age Expiry                : 0
% Similar BPDUS Rcvd           : 0
% Src Mac Count                 : 0
% Total Src Mac Rcvd            : 0
% Next State                    : Learning
% Topology Change Time          : 0

% Other Bridge information & Statistics
% -----
% STP Multicast Address         : 01:80:c2:00:00:00
% Bridge Priority                : 32768
% Bridge Mac Address            : ec:cd:6d:20:c0:ed
% Bridge Hello Time             : 2
% Bridge Forward Delay          : 15
% Topology Change Initiator     : 5023
% Last Topology Change Occured   : Mon Oct 3 05:41:20 2016
% Topology Change               : FALSE
% Topology Change Detected       : TRUE
% Topology Change Count         : 1
```


% Topology Change Last Recvd from : 00:00:00:00:00:00

Related [show spanning-tree statistics](#)
commands

show spanning-tree vlan range-index

Overview Use this command to display information about MST (Multiple Spanning Tree) instances and the VLANs associated with them including the VLAN range-index value for the device.

Syntax show spanning-tree vlan range-index

Mode Privileged Exec

Example To display information about MST instances and the VLANs associated with them for the device, including the VLAN range-index value, use the following command:

```
awplus# show spanning-tree vlan range-index
```

Output The following shows typical output.

Example output from show spanning-tree vlan range-index

```
awplus#show spanning-tree vlan range-index
% MST Instance  VLAN      RangeIdx
%      1         1         1%
```

Related commands [show spanning-tree statistics](#)

spanning-tree autoedge (RSTP and MSTP)

Overview Use this command to enable the autoedge feature on the port.

The autoedge feature allows the port to automatically detect that it is an edge port. If it does not receive any BPDUs in the first three seconds after linkup, enabling, or entering RSTP or MSTP mode, it sets itself to be an edgeport and enters the forwarding state.

Use this command for RSTP or MSTP.

Use the **no** variant of this command to disable this feature.

Syntax spanning-tree autoedge
no spanning-tree autoedge

Default Disabled

Mode Interface Configuration

Example awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# spanning-tree autoedge

Related commands [spanning-tree edgeport \(RSTP and MSTP\)](#)

spanning-tree bpdud

Overview Use this command to configure BPDU (Bridge Protocol Data Unit) discarding or forwarding, when STP is disabled on the switch. This may be needed for correct STP operation in complex networks.

There is no **no** variant for this command. Instead, apply the **discard** parameter to reset it back to the default then re-enable STP with the command **spanning-tree enable**.

Syntax spanning-tree bpdud {discard|forward|forward-untagged-vlan|forward-vlan}

Parameter	Description
bpdud	A port that has BPDU filtering enabled will not transmit any BPDUs and will ignore any BPDUs received. This port type has one of the following parameters (in Global Configuration mode):
discard	Discards all ingress STP BPDU frames.
forward	Forwards any ingress STP BPDU packets to all ports, regardless of any VLAN membership.
forward-untagged-vlan	Forwards any ingress STP BPDU frames to all ports that are untagged members of the ingress port's native VLAN.
forward-vlan	Forwards any ingress STP BPDU frames to all ports that are tagged members of the ingress port's native VLAN.

Default The discard parameter is enabled by default.

Mode Global Configuration

Usage notes This command enables the switch to forward unsupported BPDUs with an unsupported Spanning Tree Protocol, such as proprietary STP protocols with unsupported BPDUs, by forwarding BPDU (Bridge Protocol Data Unit) frames unchanged through the switch.

You must disable RSTP with the **no spanning-tree rstp enable** command before you can use this command.

When you want to revert to default behavior on the switch, issue a **spanning-tree bpdud discard** command and re-enable Spanning Tree with a **spanning-tree rstp enable** command.

Examples To enable STP BPDU discard in Global Configuration mode with STP disabled, which discards all ingress STP BPDU frames, enter the commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree rstp enable
awplus(config)# spanning-tree bpdu discard
```

To enable STP BPDU forward in Global Configuration mode with STP disabled, which forwards any ingress STP BPDU frames to all ports regardless of any VLAN membership, enter the commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree rstp enable
awplus(config)# spanning-tree bpdu forward
```

To enable STP BPDU forwarding for untagged frames in Global Configuration mode with STP disabled, which forwards any ingress STP BPDU frames to all ports that are untagged members of the ingress port's native VLAN, enter the commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree rstp enable
awplus(config)# spanning-tree bpdu forward-untagged-vlan
```

To enable STP BPDU forwarding for tagged frames in Global Configuration mode with STP disabled, which forwards any ingress STP BPDU frames to all ports that are tagged members of the ingress port's native VLAN, enter the commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree rstp enable
awplus(config)# spanning-tree bpdu forward-vlan
```

To reset STP BPDU back to the default discard parameter and re-enable RSTP on the switch, enter the commands:

```
awplus# configure terminal
awplus(config)# spanning-tree bpdu discard
awplus(config)# spanning-tree rstp enable
```

Related commands [show spanning-tree](#)
[spanning-tree enable](#)

spanning-tree cisco-interoperability (MSTP)

Overview Use this command to enable/disable Cisco-interoperability for MSTP.
Use this command for MSTP only.

Syntax spanning-tree cisco-interoperability {enable|disable}

Parameter	Description
enable	Enable Cisco interoperability for MSTP.
disable	Disable Cisco interoperability for MSTP.

Default If this command is not used, Cisco interoperability is disabled.

Mode Global Configuration

Usage For compatibility with certain Cisco devices, all devices in the switched LAN running the AlliedWare Plus™ Operating System must have Cisco-interoperability enabled. When the AlliedWare Plus Operating System is interoperating with Cisco, the only criteria used to classify a region are the region name and revision level. VLAN to instance mapping is not used to classify regions when interoperating with Cisco.

Examples To enable Cisco interoperability on a Layer 2 device:

```
awplus# configure terminal
awplus(config)# spanning-tree cisco-interoperability enable
```

To disable Cisco interoperability on a Layer 2 device:

```
awplus# configure terminal
awplus(config)# spanning-tree cisco-interoperability disable
```

spanning-tree edgeport (RSTP and MSTP)

Overview Use this command to set a port as an edge-port.

Use this command for RSTP or MSTP.

This command has the same effect as the **spanning-tree portfast (STP)** command, but the configuration displays differently in the output of some show commands.

Use the **no** variant of this command to set a port to its default state (not an edge-port).

Syntax spanning-tree edgeport
no spanning-tree edgeport

Default Not an edge port.

Mode Interface Configuration

Usage notes Use this command on a switch port connected to a LAN that has no other bridges attached. If a BPDU is received on the port that indicates that another bridge is connected to the LAN, then the port is no longer treated as an edge port.

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree edgeport

Related commands **spanning-tree autoedge (RSTP and MSTP)**

spanning-tree enable

Overview Use this command in Global Configuration mode to enable the specified spanning tree protocol for all switch ports. Note that this must be the spanning tree protocol that is configured on the device by the **spanning-tree mode** command.

Use the **no** variant of this command to disable the configured spanning tree protocol. This places all switch ports in the forwarding state.

Syntax `spanning-tree {mstp|rstp|stp} enable`
`no spanning-tree {mstp|rstp|stp} enable`

Parameter	Description
mstp	Enables or disables MSTP (Multiple Spanning Tree Protocol).
rstp	Enables or disables RSTP (Rapid Spanning Tree Protocol).
stp	Enables or disables STP (Spanning Tree Protocol).

Default RSTP is enabled by default for all switch ports.

Mode Global Configuration

Usage With no configuration, spanning tree is enabled, and the spanning tree mode is set to RSTP. To change the mode, see **spanning-tree mode**.

Examples To enable STP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# spanning-tree stp enable
```

To disable STP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree stp enable
```

To enable MSTP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# spanning-tree mstp enable
```

To disable MSTP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree mstp enable
```

To enable RSTP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# spanning-tree rstp enable
```

To disable RSTP in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# no spanning-tree rstp enable
```

Related commands [spanning-tree bpdu](#)
[spanning-tree mode](#)

spanning-tree errdisable-timeout enable

Overview Use this command to enable the errdisable-timeout facility, which sets a timeout for ports that are disabled due to the BPDU guard feature.

Use this command for RSTP or MSTP.

Use the **no** variant of this command to disable the errdisable-timeout facility.

Syntax spanning-tree errdisable-timeout enable
no spanning-tree errdisable-timeout enable

Default By default, the errdisable-timeout is disabled.

Mode Global Configuration

Usage The BPDU guard feature shuts down the port on receiving a BPDU on a BPDU-guard enabled port. This command associates a timer with the feature such that the port is re-enabled without manual intervention after a set interval. This interval can be configured by the user using the **spanning-tree errdisable-timeout interval** command.

Example awplus# configure terminal
awplus(config)# spanning-tree errdisable-timeout enable

Related commands **show spanning-tree**
spanning-tree errdisable-timeout interval
spanning-tree portfast bpdu-guard

spanning-tree errdisable-timeout interval

Overview Use this command to specify the time interval after which a port is brought back up when it has been disabled by the BPDU guard feature.

Use this command for RSTP or MSTP.

Syntax spanning-tree errdisable-timeout interval <10-1000000>
no spanning-tree errdisable-timeout interval

Parameter	Description
<10-1000000>	Specify the errdisable-timeout interval in seconds.

Default By default, the port is re-enabled after 300 seconds.

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# spanning-tree errdisable-timeout interval 34

Related commands [show spanning-tree](#)
[spanning-tree errdisable-timeout enable](#)
[spanning-tree portfast bpdu-guard](#)

spanning-tree force-version

Overview Use this command in Interface Configuration mode for a switch port interface only to force the protocol version for the switch port. Use this command for RSTP or MSTP only.

Syntax spanning-tree force-version <version>
no spanning-tree force-version

Parameter	Description
<version>	<0-3> Version identifier.
0	Forces the port to operate in STP mode.
1	Not supported.
2	Forces the port to operate in RSTP mode. If it receives STP BPDUs, it can automatically revert to STP mode.
3	Forces the port to operate in MSTP mode (this option is only available if MSTP mode is configured). If it receives RSTP or STP BPDUs, it can automatically revert to RSTP or STP mode.

Default By default, no version is forced for the port. The port is in the spanning tree mode configured for the device, or a lower version if it automatically detects one.

Mode Interface Configuration mode for a switch port interface only.

Examples Set the value to enforce the spanning tree protocol (STP):

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree force-version 0
```

Set the default protocol version:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree force-version
```

Related commands [show spanning-tree](#)

spanning-tree forward-time

Overview Use this command to set the forward delay value. Use the **no** variant of this command to reset the forward delay value to the default setting of 15 seconds.

The **forward delay** sets the time (in seconds) to control how fast a port changes its spanning tree state when moving towards the forwarding state. If the mode is set to STP, the value determines how long the port stays in each of the listening and learning states which precede the forwarding state. If the mode is set to RSTP or MSTP, this value determines the maximum time taken to transition from discarding to learning and from learning to forwarding.

This value is used only when the device is acting as the root bridge. Devices not acting as the Root Bridge use a dynamic value for the **forward delay** set by the root bridge. The **forward delay**, **max-age**, and **hello time** parameters are interrelated.

Syntax spanning-tree forward-time <forward-delay>
no spanning-tree forward-time

Parameter	Description
<forward-delay>	<4-30> The forwarding time delay in seconds.

Default The default is 15 seconds.

Mode Global Configuration

Usage notes The allowable range for forward-time is 4-30 seconds.

The **forward delay**, **max-age**, and **hello time** parameters should be set according to the following formula, as specified in IEEE Standard 802.1d:

$2 \times (\text{forward delay} - 1.0 \text{ seconds}) \geq \text{max-age}$

$\text{max-age} \geq 2 \times (\text{hello time} + 1.0 \text{ seconds})$

Example awplus# configure terminal
awplus(config)# spanning-tree forward-time 6

Related commands **show spanning-tree**
spanning-tree forward-time
spanning-tree hello-time
spanning-tree mode

spanning-tree guard root

Overview Use this command in Interface Configuration mode for a switch port only to enable the Root Guard feature for the switch port. The root guard feature disables reception of superior BPDUs. You can use this command for RSTP, STP or MSTP.

Use the **no** variant of this command to disable the root guard feature for the port.

Syntax spanning-tree guard root
no spanning-tree guard root

Mode Interface Configuration mode for a switch port interface only.

Usage notes The Root Guard feature makes sure that the port on which it is enabled is a designated port. If the Root Guard enabled port receives a superior BPDU, it goes to a Listening state (for STP) or discarding state (for RSTP and MSTP).

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree guard root

spanning-tree hello-time

Overview Use this command to set the hello-time. This sets the time in seconds between the transmission of device spanning tree configuration information when the device is the Root Bridge of the spanning tree or is trying to become the Root Bridge.

Use this command for RSTP, STP or MSTP.

Use the **no** variant of this command to restore the default of the hello time.

Syntax spanning-tree hello-time *<hello-time>*
no spanning-tree hello-time

Parameter	Description
<i><hello-time></i>	<1-10> The hello BPDU interval in seconds.

Default Default is 2 seconds.

Mode Global Configuration and Interface Configuration for switch ports.

Usage notes The allowable range of values is 1-10 seconds.
The forward delay, max-age, and hello time parameters should be set according to the following formula, as specified in IEEE Standard 802.1d:

$2 \times (\text{forward delay} - 1.0 \text{ seconds}) \geq \text{max-age}$

$\text{max-age} \geq 2 \times (\text{hello time} + 1.0 \text{ seconds})$

Example awplus# configure terminal
awplus(config)# spanning-tree hello-time 3

Related commands [spanning-tree forward-time](#)
[spanning-tree max-age](#)
[show spanning-tree](#)

spanning-tree link-type

Overview Use this command in Interface Configuration mode for a switch port interface only to enable or disable point-to-point or shared link types on the switch port.

Use this command for RSTP or MSTP only.

Use the **no** variant of this command to return the port to the default link type.

Syntax spanning-tree link-type {point-to-point|shared}
no spanning-tree link-type

Parameter	Description
shared	Disable rapid transition.
point-to-point	Enable rapid transition.

Default The default link type is point-to-point.

Mode Interface Configuration mode for a switch port interface only.

Usage notes You may want to set link type to shared if the port is connected to a hub with multiple devices connected to it.

Examples awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree link-type point-to-point

spanning-tree max-age

Overview Use this command to set the max-age. This sets the maximum age, in seconds, that dynamic spanning tree configuration information is stored in the device before it is discarded.

Use this command for RSTP, STP or MSTP.

Use the **no** variant of this command to restore the default of max-age.

Syntax spanning-tree max-age <max-age>
no spanning-tree max-age

Parameter	Description
<max-age>	<6-40> The maximum time, in seconds.

Default The default of spanning-tree max-age is 20 seconds.

Mode Global Configuration

Usage Max-age is the maximum time in seconds for which a message is considered valid.

Configure this value sufficiently high, so that a frame generated by the root bridge can be propagated to the leaf nodes without exceeding the max-age.

The **forward delay**, **max-age**, and **hello time** parameters should be set according to the following formula, as specified in IEEE Standard 802.1d:

$2 \times (\text{forward delay} - 1.0 \text{ seconds}) \geq \text{max-age}$

$\text{max-age} \geq 2 \times (\text{hello time} + 1.0 \text{ seconds})$

Example awplus# configure terminal
awplus(config)# spanning-tree max-age 12

Related commands [show spanning-tree](#)
[spanning-tree forward-time](#)
[spanning-tree hello-time](#)

spanning-tree max-hops (MSTP)

Overview Use this command to specify the maximum allowed hops for a BPDU in an MST region. This parameter is used by all the instances of the MST region.

Use the **no** variant of this command to restore the default.

Use this command for MSTP only.

Syntax spanning-tree max-hops *<hop-count>*
no spanning-tree max-hops *<hop-count>*

Parameter	Description
<i><hop-count></i>	Specify the maximum hops the BPDU will be valid for in the range <1-40>.

Default The default max-hops in a MST region is 20.

Mode Global Configuration

Usage Specifying the max hops for a BPDU prevents the messages from looping indefinitely in the network. The hop count is decremented by each receiving port. When a device receives an MST BPDU that has a hop count of zero, it discards the BPDU.

Examples awplus# configure terminal
awplus(config)# spanning-tree max-hops 25
awplus# configure terminal
awplus(config)# no spanning-tree max-hops

spanning-tree mode

Overview Use this command to change the spanning tree protocol mode on the device. The spanning tree protocol mode on the device can be configured to either STP, RSTP or MSTP.

Syntax spanning-tree mode {stp|rstp|mstp}

Default The default spanning tree protocol mode on the device is RSTP.

Mode Global Configuration

Usage With no configuration, the device will have spanning tree enabled, and the spanning tree mode will be set to RSTP. Use this command to change the spanning tree protocol mode on the device. MSTP is VLAN aware, but RSTP and STP are not VLAN aware. To enable or disable spanning tree operation, see the [spanning-tree enable](#).

Examples To change the spanning tree mode from the default of RSTP to MSTP, use the following commands:

```
awplus# configure terminal
awplus(config)# spanning-tree mode mstp
```

Related commands [spanning-tree enable](#)

spanning-tree mst configuration

Overview Use this command to enter the MST Configuration mode to configure the Multiple Spanning-Tree Protocol.

Syntax spanning-tree mst configuration

Mode Global Configuration

Examples The following example uses this command to enter MST Configuration mode. Note the change in the command prompt.

```
awplus# configure terminal
awplus(config)# spanning-tree mst configuration
awplus(config-mst)#
```

spanning-tree mst instance

Overview Use this command to assign a Multiple Spanning Tree instance (MSTI) to a switch port or channel group.

Note that ports are automatically configured to send and receive spanning-tree information for the associated MSTI when VLANs are assigned to MSTIs using the **instance vlan (MSTP)** command.

Use the **no** variant of this command in Interface Configuration mode to remove the MSTI from the specified switch port or channel group.

Syntax spanning-tree mst instance *<instance-id>*
no spanning-tree mst instance *<instance-id>*

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15. The MST instance must have already been created using the instance vlan (MSTP) command.

Default A port automatically becomes a member of an MSTI when it is assigned to a VLAN.

Mode Interface Configuration mode for a switch port or channel group.

Usage notes You can disable automatic configuration of member ports of a VLAN to an associated MSTI by using a **no spanning-tree mst instance** command to remove the member port from the MSTI. Use the **spanning-tree mst instance** command to add a VLAN member port back to the MSTI.

Examples To assign instance 3 to a switch port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree mst instance 3
```

To remove instance 3 from a switch port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree mst instance 3
```

Related commands **instance vlan (MSTP)**
spanning-tree mst instance path-cost
spanning-tree mst instance priority
spanning-tree mst instance restricted-role
spanning-tree mst instance restricted-tcn

spanning-tree mst instance path-cost

Overview Use this command to set the cost of a path associated with a switch port, for the specified MSTI.

This specifies the switch port's contribution to the cost of a path to the MSTI regional root via that port. This applies when the port is the root port for the MSTI.

Use the **no** variant of this command to restore the default cost value of the path.

Syntax `spanning-tree mst instance <instance-id> path-cost <path-cost>`
`no spanning-tree mst instance <instance-id> path-cost`

Parameter	Description
<code><instance-id></code>	Specify an MSTP instance in the range 1-15.
<code><path-cost></code>	Specify the cost of path in the range of <1-2000000000>, where a lower path-cost indicates a greater likelihood of the specific interface becoming a root.

Default The default path cost values and the range of recommended path cost values depend on the port speed, as shown in the following table from the IEEE 802.1q-2003 standard.

Port speed	Default path cost	Recommended path cost range
Less than 100 Kb/s	200,000,000	20,000,000-200,000,000
1Mbps	20,000,000	2,000,000-20,000,000
10Mbps	2,000,000	200,000-2,000,000
100 Mbps	200,000	20,000-200,000
1 Gbps	20,000	2,000-20,000
10 Gbps	2,000	200-2,000
100 Gbps	200	20-200
1Tbps	20	2-200
10 Tbps	2	2-20

Mode Interface Configuration mode for a switch port interface only.

Usage notes Before you can use this command to set a path-cost in a VLAN configuration, you must explicitly add an MST instance to a port using the **spanning-tree mst instance** command.

Examples To set a path cost of 1000 on instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree mst instance 3 path-cost 1000
```

To return the path cost to its default value on instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree mst instance 3 path-cost
```

Related commands

- instance vlan (MSTP)**
- spanning-tree mst instance**
- spanning-tree mst instance priority**
- spanning-tree mst instance restricted-role**
- spanning-tree mst instance restricted-tcn**

spanning-tree mst instance priority

Overview Use this command in Interface Configuration mode for a switch port interface only to set the port priority for an MST instance (MSTI).
Use the **no** variant of this command to restore the default priority value (128).

Syntax spanning-tree mst instance *<instance-id>* priority *<priority>*
no spanning-tree mst instance *<instance-id>* [priority]

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15.
<i><priority></i>	This must be a multiple of 16 and within the range <0 - 240>. A lower priority indicates greater likelihood of the port becoming the root port.

Default The default is 128.

Mode Interface Configuration mode for a switch port interface.

Usage notes This command sets the value of the priority field contained in the port identifier. The MST algorithm uses the port priority when determining the root port for the switch in the MSTI. The port with the lowest value has the highest priority, so it will be chosen as root port over a port that is equivalent in all other aspects but with a higher priority value.

Examples To set the priority to 112 on instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree mst instance 3 priority 112
```

To return the priority to its default value of 128 on instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree mst instance 3 priority
```

Related commands **instance vlan (MSTP)**
spanning-tree priority (port priority)
spanning-tree mst instance
spanning-tree mst instance path-cost
spanning-tree mst instance restricted-role
spanning-tree mst instance restricted-tcn

spanning-tree mst instance restricted-role

Overview Use this command in Interface Configuration mode for a switch port interface only to enable the restricted role for an MSTI (Multiple Spanning Tree Instance) on a switch port. Configuring the restricted role for an MSTI on a switch port prevents the switch port from becoming the root port in a spanning tree topology.

Use the **no** variant of this command to disable the restricted role for an MSTI on a switch port. Removing the restricted role for an MSTI on a switch port allows the switch port to become the root port in a spanning tree topology.

Syntax spanning-tree mst instance *<instance-id>* restricted-role
no spanning-tree mst instance *<instance-id>* restricted-role

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15. The MST instance must have already been created using the instance vlan (MSTP) command.

Default The restricted role for an MSTI instance on a switch port is disabled by default.

Mode Interface Configuration mode for a switch port interface only.

Usage notes The root port is the port providing the best path from the bridge to the root bridge. Use this command to disable a port from becoming a root port. Use the **no** variant of this command to enable a port to become a root port. See the **STP Feature Overview and Configuration Guide** for root port information.

Examples To prevent a switch port from becoming the root port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree mst instance 3 restricted-role
```

To stop preventing the switch port from becoming the root port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree mst instance 3 restricted-role
```

Related commands **instance vlan (MSTP)**
spanning-tree priority (port priority)
spanning-tree mst instance
spanning-tree mst instance path-cost
spanning-tree mst instance restricted-tcn

spanning-tree mst instance restricted-tcn

Overview Use this command to prevent a switch port from propagating received topology change notifications and topology changes to other switch ports. This is named restricted TCN (Topology Change Notification). A TCN is a simple Bridge Protocol Data Unit (BPDU) that a bridge sends out to its root port to signal a topology change.

Use the **no** variant of this command to stop preventing the switch port from propagating received topology change notifications and topology changes to other switch ports for the specified MSTI (Multiple Spanning Tree Instance).

The restricted TCN setting applies only to the specified MSTI (Multiple Spanning Tree Instance).

Syntax spanning-tree mst instance *<instance-id>* restricted-tcn
no spanning-tree mst instance *<instance-id>* restricted-tcn

Parameter	Description
<i><instance-id></i>	Specify an MSTP instance in the range 1-15. The MST instance must have already been created using the instance vlan (MSTP) command.

Default Disabled. By default, switch ports propagate TCNs.

Mode Interface Configuration mode for a switch port interface only.

Examples To prevent a switch port from propagating received topology change notifications and topology changes to other switch ports, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree mst instance 3 restricted-tcn
```

To stop preventing a switch port from propagating received topology change notifications and topology changes to other switch ports, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no spanning-tree mst instance 3 restricted-tcn
```

Related commands **instance vlan (MSTP)**
spanning-tree priority (port priority)
spanning-tree mst instance
spanning-tree mst instance path-cost
spanning-tree mst instance restricted-role

spanning-tree path-cost

Overview Use this command in Interface Configuration mode for a switch port interface only to set the cost of a path for the specified port. This value then combines with others along the path to the root bridge in order to determine the total cost path value from the particular port, to the root bridge. The lower the numeric value, the higher the priority of the path. This applies when the port is the root port.

Use this command for RSTP, STP or MSTP. When MSTP mode is configured, this will apply to the port's path cost for the CIST.

Syntax spanning-tree path-cost *<pathcost>*
no spanning-tree path-cost

Parameter	Description
<i><pathcost></i>	<1-200000000> The cost to be assigned to the port.

Default The default path cost values and the range of recommended path cost values depend on the port speed, as shown in the following table from the IEEE 802.1q-2003 and IEEE 802.1d-2004 standards.

Port speed	Default path cost	Recommended path cost range
Less than 100 Kb/s	200,000,000	20,000,000-200,000,000
1Mbps	20,000,000	2,000,000-20,000,000
10Mbps	2,000,000	200,000-2,000,000
100 Mbps	200,000	20,000-200,000
1 Gbps	20,000	2,000-20,000
10 Gbps	2,000	200-2, 000
100 Gbps	200	20-200
1Tbps	20	2-200
10 Tbps	2	2-20

Mode Interface Configuration mode for switch port interface only.

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree path-cost 123

spanning-tree portfast (STP)

Overview Use this command in Interface Configuration mode for a switch port interface only to set a port as an edge-port. The portfast feature enables a port to rapidly move to the forwarding state, without having first to pass through the intermediate spanning tree states. This command has the same effect as the **spanning-tree edgeport (RSTP and MSTP)** command, but the configuration displays differently in the output of some show commands.

NOTE: You can run either of two additional parameters with this command. To simplify the syntax these are documented as separate commands. See the following additional portfast commands:

- **spanning-tree portfast bpdu-filter**
- **spanning-tree portfast bpdu-guard.**

You can obtain the same effect by running the **spanning-tree edgeport (RSTP and MSTP)** command. However, the configuration output may display differently in some show commands.

Use the **no** variant of this command to set a port to its default state (not an edge-port).

Syntax spanning-tree portfast
no spanning-tree portfast

Default Not an edge port.

Mode Interface Configuration mode for a switch port interface only.

Usage notes Portfast makes a port move from a blocking state to a forwarding state, bypassing both listening and learning states. The portfast feature is meant to be used for ports connected to end-user devices. Enabling portfast on ports that are connected to a workstation or server allows devices to connect to the network without waiting for spanning-tree to converge.

For example, you may need hosts to receive a DHCP address quickly and waiting for STP to converge would cause the DHCP request to time out. Ensure you do not use portfast on any ports connected to another device to avoid creating a spanning-tree loop on the network.

Use this command on a switch port that connects to a LAN with no other bridges attached. An edge port should never receive BPDUs. Therefore if an edge port receives a BPDU, the portfast feature takes one of three actions.

- Cease to act as an edge port and pass BPDUs as a member of a spanning tree network (**spanning-tree portfast (STP)** command disabled).
- Filter out the BPDUs and pass only the data and continue to act as a edge port (**spanning-tree portfast bpdu-filter** command enabled).
- Block the port to all BPDUs and data (**spanning-tree portfast bpdu-guard** command enabled).

Example

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree portfast
```

Related commands **spanning-tree edgeport (RSTP and MSTP)**
show spanning-tree
spanning-tree portfast bpdu-filter
spanning-tree portfast bpdu-guard

spanning-tree portfast bpdu-filter

Overview This command sets the bpdu-filter feature and applies a filter to any BPDUs (Bridge Protocol Data Units) received. Enabling this feature ensures that configured ports will not transmit any BPDUs and will ignore (filter out) any BPDUs received. BPDU Filter is not enabled on a port by default.

Using the **no** variant of this command to turn off the bpdu-filter, but retain the port's status as an enabled port. If the port then receives a BPDU it will change its role from an **edge-port** to a **non edge-port**.

Syntax (Global Configuration) spanning-tree portfast bpdu-filter
no spanning-tree portfast bpdu-filter

Syntax (Interface Configuration) spanning-tree portfast bpdu-filter {default|disable|enable}
no spanning-tree portfast bpdu-filter

Parameter	Description
bpdu-filter	A port that has bpdu-filter enabled will not transmit any BPDUs and will ignore any BPDUs received. This port type has one of the following parameters (in Interface Configuration mode):
default	Takes the setting that has been configured for the whole device, i.e. the setting made from the Global configuration mode.
disable	Turns off BPDU filter.
enable	Turns on BPDU filter.

Default BPDU Filter is not enabled on any ports by default.

Mode Global Configuration and Interface Configuration

Usage notes This command filters the BPDUs and passes only data to continue to act as an edge port. Using this command in Global Configuration mode applies the portfast bpdu-filter feature to all ports on the device. Using it in Interface mode applies the feature to a specific port, or range of ports. The command will operate in both RSTP and MSTP networks.

Use the **show spanning-tree** command to display status of the bpdu-filter parameter for the switch ports.

Example To enable STP BPDU filtering in Global Configuration mode, enter the commands:

```
awplus# configure terminal
awplus(config)# spanning-tree portfast bpdu-filter
```

To enable STP BPDU filtering in Interface Configuration mode, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree portfast bpdu-filter enable
```

Related commands

- spanning-tree edgeport (RSTP and MSTP)**
- show spanning-tree**
- spanning-tree portfast (STP)**
- spanning-tree portfast bpdu-guard**

spanning-tree portfast bpdu-guard

Overview This command applies a BPDU (Bridge Protocol Data Unit) guard to the port. A port with the bpdu-guard feature enabled will block all traffic (BPDUs and user data), if it starts receiving BPDUs.

Use this command in Global Configuration mode to apply BPDU guard to all ports on the device. Use this command in Interface mode for an individual interface or a range of interfaces specified. BPDU Guard is not enabled on a port by default.

Use the **no** variant of this command to disable the BPDU Guard feature on a device in Global Configuration mode or to disable the BPDU Guard feature on a port in Interface mode.

Syntax (Global Configuration) spanning-tree portfast bpdu-guard
no spanning-tree portfast bpdu-guard

Syntax (Interface Configuration) spanning-tree portfast bpdu-guard {default|disable|enable}
no spanning-tree portfast bpdu-guard

Parameter	Description
bpdu-guard	A port that has bpdu-guard turned on will enter the STP blocking state if it receives a BPDU. This port type has one of the following parameters (in Interface Configuration mode):
default	Takes the setting that has been configured for the whole device, i.e. the setting made from the Global configuration mode.
disable	Turns off BPDU guard.
enable	Turns on BPDU guard and will also set the port as an edge port.

Default BPDU Guard is not enabled on any ports by default.

Mode Global Configuration or Interface Configuration

Usage notes This command blocks the port(s) to all devices and data when enabled. BPDU Guard is a port-security feature that changes how a portfast-enabled port behaves if it receives a BPDU. When **bpdu-guard** is set, then the port shuts down if it receives a BPDU. It does not process the BPDU as it is considered suspicious. When **bpdu-guard** is not set, then the port will negotiate spanning-tree with the device sending the BPDUs. By default, **bpdu-guard** is not enabled on a port.

You can configure a port disabled by the **bpdu-guard** to re-enable itself after a specific time interval. This interval is set with the **spanning-tree errdisable-timeout interval**. If you do not use the **errdisable-timeout** feature, then you will need to manually re-enable the port by using the **no shutdown** command.

Use the **show spanning-tree** to display the device and port configurations for the BPDU Guard feature. It shows both the administratively configured and currently running values of **bpdu-guard**.

Example To enable STP BPDU guard in Global Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# spanning-tree portfast bpdu-guard
```

To enable STP BPDU guard in Interface Configuration mode, enter the below commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree portfast bpdu-guard enable
```

Related commands

- spanning-tree edgeport (RSTP and MSTP)**
- show spanning-tree**
- spanning-tree portfast (STP)**
- spanning-tree portfast bpdu-filter**

spanning-tree priority (bridge priority)

Overview Use this command to set the bridge priority for the device. A lower priority value indicates a greater likelihood of the device becoming the root bridge.

Use this command for RSTP, STP or MSTP. When MSTP mode is configured, this will apply to the CIST.

Use the **no** variant of this command to reset it to the default.

Syntax spanning-tree priority <priority>
no spanning-tree priority

Parameter	Description
<priority>	<0-61440> The bridge priority, which will be rounded to a multiple of 4096.

Default The default priority is 32678.

Mode Global Configuration

Usage To force a particular device to become the root bridge use a lower value than other devices in the spanning tree.

Example awplus# configure terminal
awplus(config)# spanning-tree priority 4096

Related commands [spanning-tree mst instance priority](#)
[show spanning-tree](#)

spanning-tree priority (port priority)

Overview Use this command in Interface Configuration mode for a switch port interface only to set the port priority for port. A lower priority value indicates a greater likelihood of the port becoming part of the active topology.

Use this command for RSTP, STP, or MSTP. When the device is in MSTP mode, this will apply to the CIST.

Use the **no** variant of this command to reset it to the default.

Syntax spanning-tree priority <priority>
no spanning-tree priority

Parameter	Description
<priority>	<0-240>, in increments of 16. The port priority, which will be rounded down to a multiple of 16.

Default The default priority is 128.

Mode Interface Configuration mode for a switch port interface only.

Usage notes To force a port to be part of the active topology (for instance, become the root port or a designated port) use a lower value than other ports on the device. (This behavior is subject to network topology, and more significant factors, such as bridge ID.)

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree priority 16

Related commands [spanning-tree mst instance priority](#)
[spanning-tree priority \(bridge priority\)](#)
[show spanning-tree](#)

spanning-tree restricted-role

Overview Use this command in Interface Configuration mode for a switch port interface only to restrict the port from becoming a root port.

Use the **no** variant of this command to disable the restricted role functionality.

Syntax spanning-tree restricted-role
no spanning-tree restricted-role

Default The restricted role is disabled.

Mode Interface Configuration mode for a switch port interface only.

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree restricted-role

spanning-tree restricted-tcn

Overview Use this command in Interface Configuration mode for a switch port interface only to prevent TCN (Topology Change Notification) BPDUs (Bridge Protocol Data Units) from being sent on a port. If this command is enabled, after a topology change a bridge is prevented from sending a TCN to its designated bridge.

Use the **no** variant of this command to disable the restricted TCN functionality.

Syntax spanning-tree restricted-tcn
no spanning-tree restricted-tcn

Default The restricted TCN is disabled.

Mode Interface Configuration mode for a switch port interface only.

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# spanning-tree restricted-tcn

spanning-tree transmit-holdcount

Overview Use this command to set the maximum number of BPDU transmissions that are held back.
Use the **no** variant of this command to restore the default transmit hold-count value.

Syntax spanning-tree transmit-holdcount
no spanning-tree transmit-holdcount

Default Transmit hold-count default is 3.

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# spanning-tree transmit-holdcount

undebbug mstp

Overview This command applies the functionality of the no **debug mstp (RSTP and STP)** command.

16

Unidirectional Link Detection (UDLD) Commands

- Contents**
- **Introduction** on page 778
 - **debug udld** on page 779
 - **show debugging udld** on page 780
 - **show udld** on page 781
 - **show udld neighbors** on page 782
 - **show udld port** on page 784
 - **udld aggressive-mode** on page 785
 - **udld enable** on page 786
 - **udld port** on page 787
 - **udld port aggressive-mode** on page 788
 - **udld port disable** on page 789
 - **udld reset** on page 790
 - **udld time disable-period** on page 791
 - **udld time message-interval** on page 792
 - **undebg udld** on page 793

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure the Unidirectional Link Detection (UDLD) protocol.

UDLD is a data link protocol which monitors network cables and detects broken bidirectional links. It complements the spanning tree protocol (STP), which is used to eliminate Layer 2 loops.

A license is required to use this feature. Please contact your authorized Allied Telesis representative for more information.

debug udld

Overview Use this command to enable UDLD debugging.

Use the **no** variant of this command to disable UDLD debugging.

Syntax debug udld [info|pkt|state|nsm|all]
no debug udld [info|pkt|state|nsm|all]

Parameter	Description
info	Enable or disable general UDLD debugging information.
pkt	Enable or disable debugging of UDLD packets.
state	Enable or disable UDLD state transition debugging.
nsm	Enable or disable UDLD Network Service Module (NSM) debugging information.
all	Enable or disable the all UDLD debugging.

Default Debugging is disabled for **all** by default.

Mode Global Configuration
Privileged Exec

Example To enable UDLD packet debugging, use the commands:

```
awplus# configure terminal
awplus(config)# debug udld pkt
```

Related commands [show debugging udld](#)
[undebug udld](#)

show debugging udld

Overview Use this command to show which UDLD debugging options are set.

Syntax show debugging udld

Mode Privileged Exec

Example To show which UDLD debugging options are set, use the command:

```
awplus# show debugging udld
```

Output The following shows typical output.

Example output from show debugging udld

```
awplus# show debugging udld
UDLD debugging status:
  Info debugging   : off
  Packet debugging : off
  State debugging  : on
  NSM debugging    : off
```

Related commands [debug udld](#)

show udld

Overview Use this command to display global UDLD status and configuration settings.

Syntax show udld

Mode Privileged Exec

Example To show global UDLD information, use the command:
awplus# show udld

Output The following shows typical output.

Example output from show udld

```
awplus#show udld
Status      : Enabled
Mode        : Normal
Message-Interval: 7 seconds
Timeout-Interval: 5 seconds
Disable-Period : 15 seconds

[Fiber-Ports]
Port        Status   Mode        Directional-State
-----
port1.0.1   Enabled  Aggressive  Bidirectional
port1.0.2   Disabled Normal       -
```

Related commands [udld port](#)
[udld port disable](#)
[udld enable](#)

show udld neighbors

Overview Use this command to display UDLD neighbor status.

Syntax show udld neighbors [<interface-name>] [detail]

Parameter	Description
<interface-name>	Show UDLD neighbor information for a specified interface.
detail	This option provides a greater level of detail.

Mode Privileged Exec

Example To show UDLD information for all neighbors, use the command:

```
awplus# show udld neighbors
```

To show detailed UDLD neighbor information for port1.0.1, use the command:

```
awplus# show udld neighbours port1.0.1 detail
```

Output The following shows typical output.

Example output from show udld neighbors

awplus#show udld neighbors				
Port	Device-ID	Port-ID	Device-Name	Neighbor-State
-----	-----	-----	-----	-----
port1.0.1	0000F4272DA2	port2.0.1	X930	Bidirectional
port1.0.2	0000F5572632	port1.0.15	X610	Bidirectional

Example output from show udld neighbor port1.0.1 detail

awplus# show udld neighbor port1.0.1 detail	
[port1.0.1]	
Device-ID	: 0000F4272DA2
Port-ID	: port2.0.1
Device-Name	: X930
Operational-State	: Bidirectional
Expiration-time	: 35 seconds
Message-Interval	: 15 seconds
Timeout-Interval	: 5 seconds
Neighbors in Echo:	
Device-ID	Port-ID
-----	-----
0000F4272DA2	port2.0.1
0000F5572632	port1.0.15

Related commands **udld port**
udld port disable
udld enable

show udld port

Overview Use this command to display UDLD port status and configuration settings.

Syntax show udld port [<interface-name>] [detail]

Parameter	Description
<interface-name>	Show UDLD information for a specified interface.
detail	This option provides a greater level of detail.

Mode Privileged Exec

Example To show UDLD information for all ports, use the command:

```
awplus# show udld port
```

To show detailed UDLD information for port1.0.1, use the command:

```
awplus# show udld port port1.0.1 detail
```

Output The following shows typical output.

Example output from show udld port

```
awplus#show udld port
```

Port	Status	Mode	Directional-State
-----	-----	-----	-----
port1.0.1	Enabled	Aggressive	Bidirectional
port1.0.2	Disabled	Normal	-

Example output from show udld port port1.0.1 detail

```
awplus#show udld port port1.0.1 detail
```

[port1.0.1]			
Status	:	Enabled	
Mode	:	Aggressive	
Directional-State:	Bidirectional		
Operational-State:	Advertisement - single neighbor detected		
Neighbors:			
Device-ID	Port-ID	Device-Name	Directional-State
-----	-----	-----	-----
0000F4272DA2	port2.0.1	awplus	Bidirectional

Related commands

- [udld port](#)
- [udld port disable](#)
- [udld enable](#)

udld aggressive-mode

Overview Use this command to set UDLD to aggressive mode on all interfaces.

In **normal mode**, when the UDLD information times out:

- No action is taken by UDLD.
- The UDLD port state is set to undetermined.
- The port behaves according to its STP state.

In **aggressive mode**, when the UDLD information times out:

- UDLD tries to re-establish the state of the port.
- If not successful, after 8 retries, the port is disabled.

Use the **no** variant of this command to disable aggressive mode on all interfaces.

Syntax `udld aggressive-mode`
`no udld aggressive-mode`

Default Aggressive mode is disabled by default.

Mode Global Configuration

Example To enable aggressive mode on interfaces, use the commands:

```
awplus# configure terminal
awplus(config)# udld aggressive-mode
```

To disable aggressive mode, use the commands:

```
awplus# configure terminal
awplus(config)# no udld aggressive-mode
```

Related commands [udld port aggressive-mode](#)
[show udld](#)

udld enable

Overview Use this command to enable UDLD on all of a device's fiber-optic ports. It has no effect on copper ports. Use the **udld port** command to enable UDLD on copper ports.

Use the **no** variant of this command to disable the UDLD feature on all of a device's fiber interfaces.

Syntax `udld enable`
`no udld enable`

Default UDLD is disabled by default.

Mode Global Configuration

Example To enable the UDLD feature on all fiber interfaces, use the command:

```
awplus# configure terminal
awplus(config)# udld enable
```

Related commands

- show udld**
- show udld neighbors**
- udld aggressive-mode**
- udld port**
- udld port disable**
- udld reset**
- udld time disable-period**
- udld time message-interval**

udld port

Overview Use this command to enable UDLD on an interface. This command enables UDLD on both copper and fiber ports.

Use the **no** variant of this command to disable UDLD on an interface.

Syntax `udld port`
`no udld port`

Default UDLD is disabled on an interface by default.

Mode Interface Configuration

Usage notes

- This command always enables the UDLD feature on a port.
- The **udld port disable** command overwrites this command and disables UDLD on an interface.
- If UDLD has been set globally, using the **udld enable** command, then AlliedWare Plus ignores the **no udld port** command on a fiber interface.

Example To enable UDLD on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# udld port
```

To disable UDLD on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no udld port
```

Related commands

- show udld port**
- show udld neighbors**
- udld enable**
- udld port disable**
- udld reset**
- udld time disable-period**
- udld time message-interval**

udld port aggressive-mode

Overview Use this command to enable UDLD aggressive mode on an interface.

In **normal mode**, when the UDLD information times out:

- No action is taken by UDLD.
- The UDLD port state is set to undetermined.
- The port behaves according to its STP state.

In **aggressive mode**, when the UDLD information times out:

- UDLD tries to re-establish the state of the port.
- If not successful, after 8 retries, the port is disabled.

Use the **no** variant of this command to disable aggressive mode on an interface.

Syntax `udld port aggressive-mode`
`no udld port aggressive-mode`

Default Aggressive mode is disabled on an interface by default.

Mode Interface Configuration

Example To change the UDLD mode to aggressive on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# udld port aggressive-mode
```

To disable aggressive mode on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no port aggressive-mode
```

Related commands [udld aggressive-mode](#)
[show udld port](#)

udld port disable

Overview Use this command to disable UDLD on an interface. This command disables UDLD on both copper and fiber ports

Use the **no** variant of this command to allow UDLD on a fiber port.

Syntax `udld port disable`
`no udld port disable`

Default UDLD disable is not set by default.

Usage notes

- This command always disables the UDLD feature on a port.
- The **udld port** command overwrites this command and enables UDLD on an interface.
- If UDLD has been set globally, using the **udld enable** command, then AlliedWare Plus ignores the **no udld port** command on a fiber interface.

Mode Interface Configuration

Example To disable UDLD on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# udld port disable
```

To enable UDLD on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no udld port disable
```

Related commands **udld enable**
udld port
show udld port

udld reset

Overview Use this command to reset the status of any interface disabled by UDLD.

Syntax udld reset

Mode Global Configuration

Example To reset an interface that has been disabled by UDLD, use the commands:

```
awplus# configure terminal
awplus(config)# udld reset
```

Output The following shows typical output.

Example output from udld reset, when 2 ports are disabled

```
awplus#udld reset
2 ports disabled by udld reset
```

Example output from udld reset, when no ports are disabled

```
awplus#udld reset
No ports are disabled by udld reset
```

Related commands [show udld](#)
[udld enable](#)

udld time disable-period

Overview Use this command to set the UDLD disable period on all interfaces. The disable period is the time (in seconds) that a port is marked disabled before UDLD attempts to recheck it.

Manually reset the UDLD status of a port using the **udld reset** command.

Use the **no** variant of this command to reset the disable period to infinite.

Syntax `udld time disable-period <seconds>`
`no udld time disable-period`

Parameter	Description
<code><seconds></code>	30-86400 Specify the disable period in seconds.

Default The default time disable period is infinite.

Mode Global Configuration

Example To change the UDLD disable period to 60 sec on all interfaces, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# udld time disable-period 60
```

To reset the disable period to infinite, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no udld time disable-period
```

Related commands **udld enable**
udld port
show udld

udld time message-interval

Overview Use this command to set the UDLD message send interval on all interfaces. This is the time, in seconds, between UDLD probe messages. Use the **no** variant of this command to reset the message send interval to 15 seconds.

Syntax `udld time message-interval <seconds>`
`no udld time message-interval`

Parameter	Description
<seconds>	7-90Specify the message send interval in seconds.

Default The default message send interval is 15 seconds.

Mode Global Configuration

Example To change UDLD message sending interval to 30 sec on all interfaces, use the commands:

```
awplus# configure terminal
awplus(config)# udld time message-interval 30
```

To reset the message sending interval to 15 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no udld time message-interval
```

Related commands [udld enable](#)
[udld port](#)
[show udld](#)

undebbug uddl

Overview This command applies the functionality of the **no debug uddl** command.

17

Link Aggregation Commands

- Contents**
- **Introduction** on page 795
 - **channel-group** on page 796
 - **clear lacp counters** on page 798
 - **debug lacp** on page 799
 - **lacp global-passive-mode enable** on page 800
 - **lacp port-priority** on page 801
 - **lacp system-priority** on page 802
 - **lacp timeout** on page 803
 - **platform load-balancing** on page 805
 - **show debugging lacp** on page 807
 - **show diagnostic channel-group** on page 808
 - **show etherchannel** on page 810
 - **show etherchannel detail** on page 812
 - **show etherchannel summary** on page 813
 - **show lacp sys-id** on page 814
 - **show lacp-counter** on page 815
 - **show port etherchannel** on page 816
 - **show static-channel-group** on page 817
 - **static-channel-group** on page 818
 - **undebg lacp** on page 820

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure a static channel group (static aggregator) and dynamic channel group (LACP channel group, etherchannel or LACP aggregator). Link aggregation is also sometimes referred to as channeling.

NOTE: *AlliedWare Plus™ supports IEEE 802.3ad and IEEE 802.1AX link aggregation and uses the Link Aggregation Control Protocol (LACP). LACP does not interoperate with devices that use Port Aggregation Protocol (PAgP).*

Link aggregation does not necessarily achieve exact load balancing across the links. The load sharing algorithm is designed to ensure that any given data flow always goes down the same link. It also aims to spread data flows across the links as evenly as possible.

For example, for a 2 Gbps LAG that is a combination of two 1 Gbps ports, any one flow of traffic can only ever reach a maximum throughput of 1 Gbps. However, the hashing algorithm should spread the flows across the links so that when many flows are operating, the full 2 Gbps can be utilized.

For information about load balancing see the [platform load-balancing](#) command.

For a description of static and dynamic link aggregation (LACP), and configuration examples, see the [Link Aggregation and Ethernet Bonding Feature Overview and Configuration Guide](#).

channel-group

Overview

Use this command to create a dynamic channel group, or to add a port to an existing dynamic channel group.

You can create up to 124 channel groups, in any combination of static and dynamic (LACP) groups. This means you can create up to 124 dynamic channel groups, if you have no static channel groups.

Use the **no** variant of this command to turn off link aggregation on the device port. You will be returned to Global Configuration mode from Interface Configuration mode.

Syntax `channel-group <dynamic-channel-group-number> mode {active|passive}`
`no channel-group`

Parameter	Description
<code><dynamic-channel-group-number></code>	<1-248> Dynamic channel group number for an LACP link. You can create up to 124 dynamic channel groups, numbered in the range 1-248.
<code>active</code>	Enables initiation of LACP negotiation on a port. The port will transmit LACP dialogue messages whether or not it receives them from the partner device.
<code>passive</code>	Disables initiation of LACP negotiation on a port. The port will only transmit LACP dialogue messages if the partner device is transmitting them, i.e., the partner is in the active mode.

Mode Interface Configuration

Usage notes All the device ports in a channel-group must belong to the same VLANs, have the same tagging status, and can only be operated on as a group. All device ports within a channel group must have the same port speed and be in full duplex mode.

Once the LACP channel group has been created, it is treated as a device port. You can specify it in other commands. If you are specifying it in:

- an LACP command, then use the channel-group number on its own. For example, use the command **show etherchannel 2** to show details about channel group 2.
- a non-LACP command, then use **po** followed by the channel-group number. For example, use the command **show interface po2** to show details about channel group 2's interface.

For more information about LACP, see the [Link Aggregation Feature Overview and Configuration Guide](#) which is available on our website at alliedtelesis.com.

Examples To add device port1.0.2 to a newly created LACP channel group 2, in active mode, use the commands below:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# channel-group 2 mode active
```

To remove device port1.0.2 from any created LACP channel groups, use the command below:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no channel-group
```

To reference channel group 2 as an interface, use the following commands:

```
awplus# configure terminal
awplus(config)# interface po2
awplus(config-if)#
```

Related commands [show etherchannel](#)
[show etherchannel detail](#)
[show etherchannel summary](#)
[show port etherchannel](#)

Command changes Version 5.4.9-0.1: Ability added to create up to 124 groups as any combination of static and dynamic channel groups. Also, numbering changed to 1-248.

clear lacp counters

Overview Use this command to clear all counters of all present LACP aggregators (channel groups) or a given LACP aggregator.

Syntax `clear lacp [<1-248>] counters`

Parameter	Description
<1-248>	Channel-group number.

Mode Privileged Exec

Example `awplus# clear lacp 2 counters`

debug lacp

Overview Use this command to enable all LACP troubleshooting functions.
Use the **no** variant of this command to disable this function.

Syntax `debug lacp {all|cli|event|ha|packet|sync|timer[detail]}`
`no debug lacp {all|cli|event|ha|packet|sync|timer[detail]}`

Parameter	Description
all	Turn on all debugging for LACP.
cli	Specifies debugging for CLI messages. Echoes commands to the console.
event	Specifies debugging for LACP events. Echoes events to the console.
ha	Specifies debugging for HA (High Availability) events. Echoes High Availability events to the console.
packet	Specifies debugging for LACP packets. Echoes packet contents to the console.
sync	Specified debugging for LACP synchronization. Echoes synchronization to the console.
timer	Specifies debugging for LACP timer. Echoes timer expiry to the console.
detail	Optional parameter for LACP timer-detail. Echoes timer start/stop details to the console.

Mode Privileged Exec and Global Configuration

Examples `awplus# debug lacp timer detail`
`awplus# debug lacp all`

Related commands [show debugging lacp](#)
[undebug lacp](#)

lacp global-passive-mode enable

Overview Use this command to enable LACP channel-groups to dynamically self-configure when they are connected to another device that has LACP channel-groups configured with Active Mode.

Syntax lacp global-passive-mode enable
no lacp global-passive-mode enable

Default Enabled

Mode Global Configuration

Usage notes Do not mix LACP configurations (manual and dynamic). When LACP global passive mode is turned on (by using the **lacp global-passive-mode enable** command), we do not recommend using a mixed configuration in a LACP channel-group; i.e. some links are manually configured (by the **channel-group** command) and others are dynamically learned in the same channel-group.

Example To enable global passive mode for LACP channel groups, use the command:

```
awplus(config)# lacp global-passive-mode enable
```

To disable global passive mode for LACP channel groups, use the command:

```
awplus(config)# no lacp global-passive-mode enable
```

Related commands [show etherchannel](#)
[show etherchannel detail](#)

lacp port-priority

Overview Use this command to set the priority of a device port. Ports are selected for aggregation based on their priority, with the higher priority (numerically lower) ports selected first.

Use the **no** variant of this command to reset the priority of port to the default.

Syntax lacp port-priority <1-65535>
no lacp port-priority

Parameter	Description
<1-65535>	Specify the LACP port priority.

Default The default is 32768.

Mode Interface Configuration

Example awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# lacp port-priority 34

lacp system-priority

Overview Use this command to set the system priority of a local system. This is used in determining the system responsible for resolving conflicts in the choice of aggregation groups.

Use the **no** variant of this command to reset the system priority of the local system to the default.

Syntax lacp system-priority <1-65535>
no lacp system-priority

Parameter	Description
<1-65535>	LACP system priority. Lower numerical values have higher priorities.

Default The default is 32768.

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# lacp system-priority 6700

lacp timeout

Overview Use this command to set the short or long timeout on a port. Ports will time out of the aggregation if three consecutive updates are lost.

Syntax lacp timeout {short|long}

Parameter	Description
timeout	Number of seconds before invalidating a received LACP data unit (DU).
short	LACP short timeout. The short timeout value is 1 second.
long	LACP long timeout. The long timeout value is 30 seconds.

Default The default is **long** timeout (30 seconds).

Mode Interface Configuration

Usage notes This command enables the device to indicate the rate at which it expects to receive LACPDUs from its neighbor.

If the timeout is set to **long**, then the device expects to receive an update every **30** seconds, and this will time a port out of the aggregation if no updates are seen for 90 seconds (i.e. 3 consecutive updates are lost).

If the timeout is set to **short**, then the device expects to receive an update every second, and this will time a port a port out of the aggregation if no updates are seen for 3 seconds (i.e. 3 consecutive updates are lost).

The device indicates its preference by means of the Timeout field in the Actor section of its LACPDUs. If the Timeout field is set to 1, then the device has set the **short** timeout. If the Timeout field is set to 0, then the device has set the **long** timeout.

Setting the **short** timeout enables the device to be more responsive to communication failure on a link, and does not add too much processing overhead to the device (1 packet per second).

NOTE: *It is not possible to configure the rate that the device sends LACPDUs; the device must send at the rate which the neighbor indicates it expects to receive LACPDUs.*

Examples The following commands set the LACP long timeout period for 30 seconds on port1.0.2.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# lacp timeout long
```

The following commands set the LACP short timeout for 1 second on port1.0.2.

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# lacp timeout short
```


platform load-balancing

Overview This command determines which address fields are used as inputs into the load balancing algorithm for aggregated links. The output from this algorithm is used to select which individual path a given packet will traverse within an aggregated link.

The **no** variant of this command removes the specified packet type from the calculation.

Syntax `platform load-balancing [src-dst-mac] [src-dst-ip] [src-dst-port]`
`no platform load-balancing [src-dst-mac] [src-dst-ip] [src-dst-port]`

Parameter	Description
src-dst-mac	The source and destination MAC addresses (Layer 2)
src-dst-ip	The source and destination IP addresses (Layer 3)
src-dst-port	The source and destination TCP/UDP port data (Layer 4). If you include this option, make sure that src-dst-ip is also selected.

Default Includes the **src-dst-mac** and **src-dst-ip** addresses as inputs into the platform load balancing algorithm.

Mode Global configuration

Usage notes Useful combinations of inputs are:

- MAC address and IP address (the default)
- MAC address only
- MAC address, IP address and Layer 4 port number
- IP address and Layer 4 port number
- IP address only

The following examples show how to configure each of these combinations.

Note the following restrictions:

- you can only stop using MAC addresses (**src-dst-mac**) if you still have IP addresses (**src-dst-ip**) selected
- if you specify Layer 4 ports (**src-dst-port**), you should also specify IP addresses (**src-dst-ip**)

Use the **show platform** command to verify this command's setting.

Examples To use MAC addresses and IP addresses, you do not have to enter any commands, because this is the default. Note that this setting is not displayed in the **show running-config** output. Use the **show platform** command to verify this setting.

To use MAC addresses only, remove IP addresses by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-ip
```

To use MAC addresses, IP addresses and Layer 4 port numbers, add Layer 4 port numbers by using the commands:

```
awplus# configure terminal
awplus(config)# platform load-balancing src-dst-port
```

To use IP addresses and Layer 4 port numbers, remove MAC addresses and add Layer 4 port numbers by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
awplus(config)# platform load-balancing src-dst-port
```

To use IP addresses only, remove MAC addresses by using the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
```

Related commands **show platform**

show debugging lacp

Overview Use this command to see what debugging is turned on for LACP management.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging lacp

Mode User Exec and Privileged Exec

Example awplus# show debugging lacp

Output The following shows typical output.

Example output from the show debugging lacp command

```
LACP debugging status:  
LACP timer debugging is on  
LACP timer-detail debugging is on  
LACP cli debugging is on  
LACP packet debugging is on  
LACP event debugging is on  
LACP sync debugging is on
```

Related commands [debug lacp](#)

show diagnostic channel-group

Overview This command displays dynamic and static channel group interface status information. The output of this command is useful for Allied Telesis authorized service personnel for diagnostic purposes.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show diagnostic channel-group

Mode User Exec and Privileged Exec

Example awplus# show diagnostic channel-group

Output The following shows typical output.

Example output from the show diagnostic channel-group command

```
awplus#show diagnostic channel-group

Channel Group Info based on NSM:
Note: Pos - position in hardware table
-----
Dev  Interface  IfIndex  Member port  IfIndex  Active  Pos
-----
    sa3        4503    port1.0.15  5015        No
    sa3        4503    port1.0.18  5018        No
    po1        4601    port1.0.7   5007        No
    po1        4601    port1.0.8   5008        No
    po1        4601    port1.0.9   5009        No

Channel Group Info based on HSL:
Note: Pos - position in hardware table
-----
Dev  Interface  IfIndex  Member port  IfIndex  Active  Pos
-----
    sa3        4503                        N/a
    po1        4601                        N/a

Channel Group Info based on IPIFWD:
Note: Pos - position in hardware table
-----
Dev  Interface  IfIndex  Member port  IfIndex  Active  Pos
-----
    sa3        4503                        N/a
    po1        4601                        N/a

Channel Group Info based on HW:
Note: Pos - position in hardware table
      Only entries from first device are displayed.
-----
Dev  Interface  IfIndex  Member port  IfIndex  Active  Pos
-----
    sa3        4503                        N/a
    po1        4601                        N/a

No error found
```

Related commands [show tech-support](#)

show etherchannel

Overview Use this command to display information about an LACP channel specified by the channel group number.

The command output also shows the thrash limiting status. If thrash limiting is detected and the **action** parameter of the **thrash-limiting** command is set to **vlan-disable**, the output will also show the VLANs on which thrashing is detected.

For information on filtering and saving command output, see the **"Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide**, which is available on our website at alliedtelesis.com.

Syntax show etherchannel [<1-248>]

Parameter	Description
<1-248>	Channel-group number.

Mode User Exec and Privileged Exec

Example awplus# show etherchannel

Output The following shows typical output.

Example output from show etherchannel

```
awplus#show etherchannel
LAG Maximum      : 124
LAG Static Count : 0
LAG Dynamic Count : 1
LAG Total Count  : 1
Lacp Aggregator: po1
Member:
  port1.0.1
  port1.0.2
```

Example awplus# show etherchannel 1

Output The following shows typical output.

Example output from show etherchannel for a particular channel

```
awplus#show etherchannel 1
Aggregator po1 (4601)
  Mac address: 00:00:00:00:00:00
  Admin Key: 0001 - Oper Key 0000
  Receive link count: 0 - Transmit link count: 0
  Individual: 0 - Ready: 0
  Partner LAG: 0x0000,00-00-00-00-00-00
  Link: port1.0.1 (5001) disabled
  Link: port1.0.2 (5002) disabled
```

show etherchannel detail

Overview Use this command to display detailed information about all LACP channels.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show etherchannel detail

Mode User Exec and Privileged Exec

Example awplus# show etherchannel detail

Output The following shows typical output.

Example output from show etherchannel detail

```
awplus#show etherchannel detail
Aggregator po1 (IfIndex: 4601)
  Mac address: 00:00:cd:37:05:17
  Admin Key: 0001 - Oper Key 0001
  Receive link count: 2 - Transmit link count: 2
  Individual: 0 - Ready: 1
  Partner LAG: 0x8000,00-00-cd-37-02-9a,0x0001
    Link: port1.0.1 (IfIndex: 8002) synchronized
    Link: port1.0.2 (IfIndex: 20002) synchronized
Aggregator po2 (IfIndex: 4602)
  Mac address: 00:00:cd:37:05:17
  Admin Key: 0002 - Oper Key 0002
  Receive link count: 2 - Transmit link count: 2
  Individual: 0 - Ready: 1
  Partner LAG: 0x8000,ec-cd-6d-aa-c8-56,0x0002
    Link: port1.0.3 (IfIndex: 8001) synchronized
    Link: port1.0.4 (IfIndex: 20001) synchronized
```


show etherchannel summary

Overview Use this command to display a summary of all LACP channels.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show etherchannel summary

Mode User Exec and Privileged Exec

Example awplus# show etherchannel summary

Output The following shows typical output.

Example output from show etherchannel summary

```
awplus#show etherchannel summary
Aggregator po10 (IfIndex: 4610)
Admin Key: 0010 - Oper Key 0010
Link: port1.0.1 (IfIndex: 7007) synchronized
Link: port1.0.2 (IfIndex: 8007) synchronized
Link: port1.0.3 (IfIndex: 11007) synchronized
```

show lacp sys-id

Overview Use this command to display the LACP system ID and priority.
For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show lacp sys-id

Mode User Exec and Privileged Exec

Example awplus# show lacp sys-id

Output The following shows typical output.

Example output from show lacp sys-id

```
System Priority: 0x8000 (32768)
MAC Address: 0200.0034.5684
```

show lacp-counter

Overview Use this command to display the packet traffic on all ports of all present LACP aggregators, or a given LACP aggregator.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show lacp-counter [<1-248>]

Parameter	Description
<1-248>	Channel-group number.

Mode User Exec and Privileged Exec

Example awplus# show lacp-counter 2

Output The following shows typical output.

Example output from show lacp-counter

% Traffic statistics						
Port	LACPDUs		Marker		Pckt err	
	Sent	Recv	Sent	Recv	Sent	Recv
% Aggregator po2 (IfIndex: 4604)						
port1.0.2	0	0	0	0	0	0

show port etherchannel

Overview Use this command to show LACP details of the device port specified.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show port etherchannel <port>

Parameter	Description
<port>	Name of the device port to display LACP information about.

Mode User Exec and Privileged Exec

Example awplus# show port etherchannel port1.0.2

Output The following shows typical output.

Example output from show port etherchannel

```
awplus#show port etherchannel port1.0.2
LACP link info: port1.0.2 - 7007
Link: port1.0.2 (IfIndex: 7007)
Aggregator: po10 (IfIndex: 4610)
Receive machine state: Current
Periodic Transmission machine state: Slow periodic
Mux machine state: Collecting/Distributing
Actor Information:
Selected ..... Selected
Physical Admin Key ..... 2
Port Key ..... 10
Port Priority ..... 32768
Port Number ..... 7007
Mode ..... Active
Timeout ..... Long
Individual ..... Yes
Synchronised ..... Yes
Collecting ..... Yes
Distributing ..... Yes
Defaulted ..... No
Expired ..... No
Partner Information:
Partner Sys Priority ..... 0x8000
Partner System .. ec-cd-6d-d1-64-d0
Port Key ..... 10
Port Priority ..... 32768
Port Number ..... 5001
Mode ..... Active
Timeout ..... Long
Individual ..... Yes
Synchronised ..... Yes
Collecting ..... Yes
Distributing ..... Yes
Defaulted ..... No
Expired ..... No
```

show static-channel-group

Overview Use this command to display all configured static channel groups and their corresponding member ports. Note that a static channel group is the same as a static aggregator.

The command output also shows the thrash limiting status. If thrash limiting is detected and the **action** parameter of the **thrash-limiting** command is set to **vlan-disable**, the output will also show the VLANs on which thrashing is detected.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**, which is available on our website at alliedtelesis.com.

Syntax show static-channel-group

Mode User Exec and Privileged Exec

Example awplus# show static-channel-group

Output The following shows typical output.

Example output from show static-channel-group

```
% LAG Maximum      : 124
% LAG Static Count  : 2
% LAG Dynamic Count : 0
% LAG Total Count   : 2
% Static Aggregator: sa2
% Member:
  port1.0.1
  port1.0.2
% Static Aggregator: sa3
% Member:
  port1.0.3
  port1.0.4
```

Related commands **[static-channel-group](#)**

static-channel-group

Overview Use this command to create a static channel group, or to add a port to an existing static channel group. Static channel groups are also known as static aggregators.

You can create up to 124 channel groups, in any combination of static and dynamic (LACP) groups. This means you can create up to 124 static channel groups, if you have no dynamic channel groups.

Use the **no** variant of this command to remove the device port from the static channel group.

Syntax static-channel-group <static-channel-group-number> [member-filters]
no static-channel-group

Parameter	Description
<static-channel-group-number>	Static channel group number from the range 1 to 248. You can create up to 124 static channel groups.
member-filters	Allow QoS and ACL settings to be configured on the aggregator's individual member ports, instead of the aggregator itself. This configuration is required when using QoS Storm Protection on a static aggregator.

Mode Interface Configuration

Usage notes This command adds the device port to the static channel group with the specified channel group number. If the channel group does not exist, it is created, and the port is added to it. The **no** prefix detaches the port from the static channel group. If the port is the last member to be removed, the static channel group is deleted.

All the ports in a channel group must have the same VLAN configuration: they must belong to the same VLANs and have the same tagging status, and can only be operated on as a group.

Once the static channel group has been created, it is treated as a device port. You can specify it in other commands by using **sa** followed by the channel-group number. For example, use the command **show interface sa2** to show details about channel group 2's interface:

Examples To define static channel group 2 on port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# static-channel-group 2
```

To reference static channel group 2 as an interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface sa2
awplus(config-if)#
```

To make it possible to use QoS Storm Protection on static channel group 2 on port1.0.2, with an ACL named "test-acl", use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# static-channel-group 2 member-filters
awplus(config-if)# access-group test-acl
```

Related commands [show static-channel-group](#)

Command changes Version 5.4.9-0.1: Ability added to create up to 124 groups as any combination of static and dynamic channel groups. Also, numbering changed to 1-248.

undebbug lacp

Overview This command applies the functionality of the no **debug lacp** .

18

Power over Ethernet Commands

- Contents**
- **Introduction** on page 822
 - **clear power-inline counters interface** on page 823
 - **debug power-inline** on page 824
 - **power-inline allow-legacy** on page 826
 - **power-inline autotclass** on page 827
 - **power-inline description** on page 829
 - **power-inline disconnect-defer** on page 830
 - **power-inline enable** on page 831
 - **power-inline hanp** on page 832
 - **power-inline max** on page 833
 - **power-inline pair max** on page 835
 - **power-inline priority** on page 837
 - **power-inline usage-threshold** on page 839
 - **service power-inline** on page 840
 - **show debugging power-inline** on page 841
 - **show power-inline** on page 842
 - **show power-inline counters** on page 846
 - **show power-inline interface** on page 849
 - **show power-inline interface detail** on page 852

Introduction

Overview This chapter contains an alphabetical list of commands used to configure Power over Ethernet (PoE). Each command contains a functional description and shows examples of configuration and output screens for show commands. These commands are only supported on PoE capable ports. An error message will display on the console if you enter a PoE command on a port that does not support PoE. The following documents offer further information for configuring PoE on AlliedWare Plus switches.

- the **PoE Feature Overview and Configuration_Guide**.
- the **Support for Allied Telesis Enterprise_MIBs_in AlliedWare Plus**, for information about which PoE MIB objects are supported.
- the **SNMP Feature Overview and Configuration_Guide**, for information about SNMP traps.

Power over Ethernet (PoE) is a technology allowing devices such as security cameras to receive power over LAN cabling.

The Powered Device (PD) referred to throughout this chapter is a PoE or PoE+ powered device, such as an IP phone or a Wireless Access Point (AP).

clear power-inline counters interface

Overview This command will clear the counters from a specified port, a range of ports, or all ports on the switch. If no ports are entered then PoE counters for all ports are cleared. It will also clear all Power over Ethernet (PoE) counters supported by the Power Ethernet MIB (RFC 3621).

Syntax clear power-inline counters interface [*<port-list>*]

Parameter	Description
<i><port-list></i>	Selects the port or ports whose counters are to be cleared.

Mode Privileged Exec

Usage notes The PoE counters are displayed with the **show power-inline counters** command.

Examples To clear the PoE counters for port1.0.2 only, use the following command:

```
awplus# clear power-inline counters interface port1.0.2
```

To clear the PoE counters for port1.0.5 through port1.0.8, use the following command:

```
awplus# clear power-inline counters interface port1.0.5-  
port1.0.8
```

To clear the PoE counters for all ports, use the following command:

```
awplus# clear power-inline counters interface
```

Related commands **show power-inline counters**

Command changes Version 5.4.8-0.2: added to x550 series products

debug power-inline

Overview This command enables debugging display for messages that are specific to Power over Ethernet (PoE).

Use the **no** variant of this command to disable the specified PoE debugging messages.

Syntax debug power-inline [all|event|info|power]
no debug power-inline [all|event|info|power]

Parameter	Description
all	Displays all (event, info, nsm, power) debug messages.
event	Displays event debug information, showing any error conditions that may occur during PoE operation.
info	Displays informational level debug information, showing high-level essential debugging, such as information about message types.
power	Displays power management debug information.

Default No debug messages are enabled by default.

Mode Privileged Exec

Usage notes Use the **terminal monitor** command to display PoE debug messages on the console.

Use the **show debugging power-inline** command to show the PoE debug configuration.

Examples To enable PoE debugging and start the display of PoE event and info debug messages on the console, use the following commands:

```
awplus# terminal monitor
awplus# debug power-inline event info
```

To enable PoE debugging and start the display of all PoE debugging messages on the console, use the following commands:

```
awplus# terminal monitor
awplus# debug power-inline all
```

To stop the display of PoE info debug messages on the console, use the following command:

```
awplus# no debug power-inline info
```

To disable all PoE debugging and stop the display of any PoE debugging messages on the console, use the following command:

```
awplus# no debug power-inline all
```

Related commands [show debugging power-inline](#)
[terminal monitor](#)

Command changes Version 5.4.8-0.2: added to x550 series products

power-inline allow-legacy

Overview This command enables detection of pre-IEEE 802.3af Power Ethernet standard legacy powered devices (PDs).
The **no** variant of this command disables detection of pre-IEEE 802.3af Power Ethernet standard legacy powered devices.

Syntax power-inline allow-legacy
no power-inline allow-legacy

Default Detection of legacy PDs is disabled on all ports

Mode Global Configuration

Examples To enable detection of legacy PDs, use the following commands:

```
awplus# configure terminal
awplus(config)# power-inline allow-legacy
```

To disable detection of legacy PDs, use the following commands:

```
awplus# configure terminal
awplus(config)# no power-inline allow-legacy
```

Validation **show power-inline**
Commands **show running-config** power-inline

Command changes Version 5.4.8-0.2: added to x550 series products
Version 5.4.9-0.1: default changed to “disabled”

power-inline autoclass

Overview This command is available on the x320-10GH.

Use this command to enable autoclass for physical layer power classification of the port the next time a PD is powered up on the port.

Use the **no** variant of this command to disable autoclass. This will have no effect until the next time a PD is powered up on the port.

Syntax power-inline autoclass
no power-inline autoclass

Default Disabled.

Mode Interface Configuration

Usage notes When a powered device (PD) is connected to an autoclass-enabled port, the power sourcing equipment (PSE) will check the PD for autoclass support. If the PD supports this, the switch sets the power limit on the port to the maximum power consumption drawn by the PD during the autoclass procedure. The switch adds the power difference back to the available budget to use for the other ports.

If the PD does not support autoclass, the port uses the default class-based setting unless:

- you configure a power limit on the port or
- a maximum power limit is set via LLDP.

If a PD is already powered on the port when you configure autoclass, the switch will not use autoclass until the next time a PD is powered up on the port. The port's power limit stays at its current setting.

Example To enable autoclass on port1.0.1, so that it will try to perform autoclass on the next PD power-up event, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# power-inline autoclass
```

To disable autoclass on port1.0.1, so that it will not try to perform autoclass on the next PD power-up event, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no power-inline autoclass
```

Note that it will continue to use its current setting until the next time a PD is powered up.

Related commands **power-inline enable**
service power-inline
show power-inline
show power-inline interface detail

Command changes Version 5.4.9-2.1: command added

power-inline description

Overview This command adds a description for a Powered Device (PD) connected to a PoE port.

The **no** variant of this command clears a previously entered description for a connected PD, resetting the PD description to the default (null).

Syntax power-inline description *<pd-description>*
no power-inline description

Parameter	Description
<i><pd-description></i>	Description of the PD connected to the PoE capable port (with a maximum 256 character string limit per PD description).

Default No description for a connected PD is set by default.

Mode Interface Configuration

Usage notes Select a PoE port, a list of PoE ports, or a range of PoE ports with the preceding **interface (to configure)** command. If you specify a range or list of ports they must all be PoE capable ports.

Examples To add the description “Desk Phone” for a connected PD on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# power-inline description Desk Phone
```

To clear the description for the connected PD on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no power-inline description
```

Related commands **show power-inline interface**
show running-config *<power-inline>*

Command changes Version 5.4.8-0.2: added to x550 series products

power-inline disconnect-defer

Overview Use this command to defer the DC disconnect detection in hardware. Some 60W PDs take longer than the 802.3 at standard time for drawing the minimum DC current on an individual pair. By deferring the enabling of the DC disconnect logic, both sets of pairs can power up and start drawing current.

Use the optional timeout value when non-standard PDs, such as FLIR (Forward Looking InfraRed) cameras are used.

Use the **no** variant of this command to revert to the default setting.

Syntax power-inline disconnect-defer [*<disconnect-defer-timeout>*]
no power-inline disconnect-defer

Parameter	Description
<i><disconnect-defer-timeout></i>	Optional timeout value of 1-10s

Default Disabled

Mode Interface Configuration

Example To enable disconnect deferral on port 1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port 1.0.1
awplus(config-if)# power-inline disconnect-defer
```

To enable disconnect deferral on port 1.0.1, with a disconnect-defer-timeout of 2 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# interface port 1.0.1
awplus(config-if)# power-inline disconnect-defer 2
```

Related commands [show power-inline](#)

Command Version 5.5.0-2.3: command added

changes Version 5.5.1-1.1: added **disconnect-defer-timeout** parameter

power-inline enable

Overview This command enables Power over Ethernet (PoE) to detect a connected Powered Device (PD) and supply power.

The **no** variant of this command disables PoE functionality on the selected PoE port(s). No power is supplied to a connected PD after PoE is disabled on the selected PoE port(s).

Ports still provide Ethernet connectivity after PoE is disabled.

Syntax power-inline enable
no power-inline enable

Default PoE is enabled by default on all ports

Mode Interface Configuration for one or more PoE switchports.

Usage notes No PoE log messages are generated for ports on which PoE is disabled.

Examples To disable PoE on port1.0.1 to port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# no power-inline enable
```

To enable PoE on port1.0.1 to port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# power-inline enable
```

Related commands [show power-inline](#)
[show power-inline interface](#)
[show power-inline interface detail](#)
[show running-config power-inline](#)

Command changes Version 5.4.8-0.2: added to x550 series products

power-inline hanp

Overview Use this command to enable High Availability Network Power (HANP), also known as Continuous PoE. Continuous PoE enables the switches to perform actions such as software upgrades without forcing the Powered Devices to power cycle. This means, for example, if you are rebooting a switch connected to a PD such as a camera, Continuous PoE allows the camera to buffer while the switch is rebooted. You can configure it on a global or per port level. Enabling it globally enables it on all PoE ports.

Use the **no** variant of this command to disable Continuous PoE globally or on the specified ports.

Syntax power-inline hanp
no power-inline hanp

Default Continuous PoE is disabled globally by default. If you enable it globally, that enables it on all ports.

Mode User Exec/Privileged Exec or Interface Configuration for a PoE port

Example To enable Continuous PoE on all ports, use the commands:

```
awplus# configure terminal  
awplus(config)# power-inline hanp
```

To enable Continuous PoE on all ports except port 1.0.5, use the commands:

```
awplus# configure terminal  
awplus(config)# power-inline hanp  
awplus(config)# interface port1.0.5  
awplus(config-if)# no power-inline hanp
```

Related commands [show power-inline](#)
[show power-inline interface](#)
[show power-inline interface detail](#)

Command changes Version 5.4.6-2.1: command added
Version 5.4.7-0.1: added to x930 series products
Version 5.4.8-0.2: added to x550 series products
Version 5.4.8-2.1: added to x220 series products

power-inline max

Overview This command sets the maximum power allocated to a Power over an Ethernet (PoE and PoE+) port. The amount of power actually supplied to the port depends on the power requirements of the connected PD. It is also a function of the total PoE power loading on the switch and the PoE priority set for the port by the **power-inline priority** command. However this command (power-inline max) does apply a maximum value to the power that the port is able to supply.

This switch allocates power dynamically, so you do not need to use this command to set it statically. If you do use this command, the values specified in this command will override the dynamic allocation and will control the power output for each port.

Note that the value set by this command will be the figure the switch will use when apportioning the power budget for its ports. For example, if 15.4 W is assigned to a port whose PD only consumes 5 W, the switch will reserve the full 15.4 W for this port when determining its total power PoE power requirement.

The **no** variant of this command sets the maximum power supplied to a PoE port to the default, which is set to the maximum power limit for the class of the connected Powered Device (PD).

Syntax power-inline max <4000-30000>
no power-inline max

Parameter	Description
<4000-30000>	The maximum power supplied to a PoE port in milliwatts (mW).

Default By default, the switch dynamically determines the power used by the PD connected to the port.

Mode Interface Configuration for one or more ports. If you specify a range or list of ports, they must all be PoE capable ports.

Usage notes If you select a range of PoE ports in Interface Configuration mode before issuing this command, then each port in the range selected will have the same maximum power value configured.

If a PoE port attempts to draw more than the maximum power, this is logged and all power is removed.

Note that the value entered is rounded up to the next value supported by the hardware. The actual value used is displayed after you enter the command, such as in the following sample console output:

```
awplus#configure terminal
awplus(config)#interface port1.0.1
awplus(config-if)#power-line max 5300
% The maximum power has been rounded to 5450mW in hardware.
```

See the [LLDP Feature Overview and Configuration Guide](#) for information about power monitoring at the PD.

Note the difference in power supplied from the PSE to the power available at the PD due to line loss.

See the [PoE Feature Overview and Configuration Guide](#) for further information about the difference between the power supplied from the PSE and the power available at the PD.

Examples To set the maximum power supplied to ports in the range port1.0.1 to port1.0.4 to 6450mW per port, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2-port1.0.4
awplus(config-if)# power-inline max 6450
```

To clear the user-configured maximum power supplied to port1.0.1, and revert to using the default maximum power, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no power-inline max
```

Related commands [show power-inline interface](#)
[show running-config power-inline](#)

Command changes Version 5.4.8-0.2: added to x550 series products

power-inline pair max

Overview Use this command to set the maximum power that can be supplied to a specific cable pair. If the pair attempts to draw more than this, the switch will create a log entry and stop supplying power over that pair.

Use the **no** variant of this command to remove the maximum power setting.

This command applies to x320-10GH switches.

Syntax `power-inline pair {data|spare} max <4000-100000>`
`no power-inline pair {data|spare} max`

Parameter	Description
data	Set the maximum power for pins 1, 2, 3 and 6.
spare	Set the maximum power for pins 4, 5, 7 and 8.
max <4000-100000>	The maximum power, in milliwatts.

Default By default, the switch supplies the maximum power limit for the power class of the PD connected to the port.

Mode Interface Configuration for ports 1.0.1-1.0.8

Usage notes This command enables you to set the maximum power on individual cable pairs on PoE++ ports, which may be helpful with dual-signature PDs. You can also use the **power-inline max** command to set the maximum power on PoE ports. On the PoE++ ports, the **power-inline max** command gives each pair the specified maximum power level.

The switch's total PoE budget is divided between all the PoE ports.

Example To enable the switch to supply up to 40W of power over ports 1.0.1-1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# power-inline pair data max 20000
awplus(config-if)# power-inline pair spare max 20000
```

To return to supplying the default maximum over each pair on port 1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no power-inline pair data max
awplus(config-if)# no power-inline pair spare max
```

Related commands

- power-inline max**
- show power-inline**
- show power-inline interface**
- show power-inline interface detail**
- show running-config power-inline**

power-inline priority

Overview This command sets the Power over Ethernet (PoE) priority level of a PoE port to one of three available priority levels:

- low
- high
- critical

The **no** variant of this command restores the PoE port priority to the default (low).

Syntax power-inline priority {low|high|critical}
no power-inline priority

Parameter	Description
low	The lowest priority for a PoE enabled port (default). PoE ports set to low only receive power if all the PoE ports assigned to the other two levels are already receiving power.
high	The second highest priority for a PoE enabled port. PoE ports set to high receive power only if all the ports set to critical are already receiving power.
critical	The highest priority for a PoE enabled port. PoE ports set to critical are guaranteed power before any ports assigned to the other two priority levels. Ports assigned to the other priority levels receive power only if all critical ports are receiving power.

Default The default priority is **low** for all PoE ports

Mode Interface Configuration

Usage notes This command is supported on all PoE capable ports, whether operating as a stand-alone switch, or within a VCStack.

Select a PoE port, a list of PoE ports, or a range of PoE ports with the preceding **interface (to configure)** command. If you specify a range or list of ports they must all be PoE capable ports.

PoE ports with higher priorities are given power before PoE ports with lower priorities. If the priorities for two PoE ports are the same then the lower numbered PoE port is given power before the higher numbered PoE port.

See the **PoE Feature Overview and Configuration Guide** for further information about PoE priority.

Examples To set the priority level to high on port1.0.1 to port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# power-inline priority high
```

To reset the priority level to the default of low on port1.0.1 to port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# no power-inline priority
```

Related commands [power-inline usage-threshold](#)
[show power-inline](#)
[show power-inline interface](#)
[show running-config power-inline](#)

Command changes Version 5.4.8-0.2: added to x550 series products

power-inline usage-threshold

Overview This command sets the level at which the switch will issue a message that the power supplied to all Powered Devices (PDs) has reached a critical level of the nominal power rating for the switch. The level is set as a percentage of total available power.

The **no** variant of this command resets the notification usage-threshold to the default (80% of the nominal power rating).

Syntax power-inline usage-threshold <1-99>
no power-inline usage-threshold

Parameter	Description
<1-99>	The usage-threshold percentage configured with this command.

Default The default power usage threshold is 80% of the nominal power rating

Mode Global Configuration

Usage notes Use the [snmp-server enable trap](#) to configure SNMP notification. An SNMP notification is sent when the usage-threshold, as configured in the example, is exceeded.

Examples To generate SNMP notifications when power supplied exceeds 70% of the nominal power rating, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap power-inline
awplus(config)# power-inline usage-threshold 70
```

To reset the notification threshold to the default (80% of the nominal power rating), use the following commands:

```
awplus# configure terminal
awplus(config)# no power-inline usage-threshold
```

Related commands [snmp-server enable trap](#)
[show power-inline interface](#)
[show running-config](#) power-inline

Command changes Version 5.4.8-0.2: added to x550 series products

service power-inline

Overview This command enables Power over Ethernet (PoE) globally on the switch, for all PoE ports.

Syntax service power-inline
no service power-inline

Default PoE functionality is enabled by default

Mode Global Configuration

Usage notes In a stack, issuing this command enables PoE globally for all PoE ports.
In a stack configuration, only stack members containing PoE hardware will have PoE enabled by default in software.

Examples To disable PoE, use the following commands:
awplus# configure terminal
awplus(config)# no service power-inline
To re-enable PoE, if PoE has been disabled, use the following commands:
awplus# configure terminal
awplus(config)# service power-inline

Related commands [show power-inline](#)
[show running-config power-inline](#)

Command changes Version 5.4.8-0.2: added to x550 series products

show debugging power-inline

Overview This command displays Power over Ethernet (PoE) debug settings.

Syntax show debugging power-inline

Mode User Exec and Privileged Exec

Example To display PoE debug settings, use the following command:

```
awplus# show debugging power-inline
```

Output The following shows typical output.

Example output from the show debugging power-inline command

```
awplus#show debugging power-inline
PoE Debugging status:
PoE Informational debugging is disabled
PoE Event debugging is disabled
PoE Power Management debugging is disabled

PoE NSM debugging is enabled
```

Related commands [debug power-inline](#)
[terminal monitor](#)

Command changes Version 5.4.8-0.2: added to x550 series products

show power-inline

Overview This command displays the Power over Ethernet (PoE) status for all ports. For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show power-inline

Mode User Exec and Privileged Exec

Example To display the PoE status for all ports, use the following command:
awplus# show power-inline

Output Example output from show power-inline.

```
awplus#show power-inline
PoE Status:

Stack member 1
Nominal Power: 240W
Power Allocated: 30W
Power Requested: 30W
Actual Power Consumption: 3W
Operational Status: On
Power Usage Threshold: 80% (192W)
Detection of legacy devices is disabled
Power Source: PSU
High Availability Network Power: Disabled
Thermal State: Operational
Power management mode: Static

PoE Interface:
Interface/   Admin   Pri  Oper   Power Device   Class Max
Pair                                     (mW)                                     (mW)
port1.0.1/D  Enabled Low  Powered 3432 n/a          4 30000 [C]
port1.0.2/D  Enabled Low  Off      0 n/a          n/a  n/a
port1.0.3/D  Enabled Low  Off      0 n/a          n/a  n/a
port1.0.4/D  Enabled Low  Off      0 n/a          n/a  n/a
...
```

Parameters in the show power -inline command output

Parameter	Description
Nominal Power	The nominal power available on the switch in watts (W).
Power Allocated	The current power allocated in watts (W) that is available to be drawn by any connected Powered Devices (PDs). This is updated every 5 seconds.
Actual Power Consumption	The current power consumption in watts (W) drawn by all connected Powered Devices (PDs). This is updated every 5 seconds.
Operational Status	The operational status of the PSU hardware when this command was issued: • On if the PSU is installed and switched on. • Off when the PSU is switched off (an RPS may be connected to the switch to power PoE instead of the PSU). • Fault when there is an issue with the PSU hardware.
Power Usage Threshold (%)	The configured SNMP trap / log threshold, as configured from a power-inline usage-threshold command.
Power Source	PD (Class x) if the device is currently powered by a PD port, or otherwise PSU.
Power management mode: Dynamic	Indicates that PoE power is allocated dynamically, based on the current usage of each PD attached to the switch's ports. When you connect a new PD to the switch, the switch determines whether it can power that device by measuring the power the existing PDs are currently using. If there is sufficient power available, the switch will allocate it to the new device.
High Availability Network Power	Whether High Availability Network Power is enabled or disabled globally. HANP is also known as Continuous PoE. Continuous PoE enables the switch to perform actions such as software upgrades without forcing the Powered Devices to power cycle. This allows, for example, IP cameras to buffer data instead of losing it.
Interface	The PoE port(s) in the format port1.0.z, where z is the port number. After the port number, "/D" indicates the data pair and "/S" indicates the spare pair (for ports that support PoE++).

Parameter	Description
Admin	The administrative state of PoE on a PoE port, either Enabled or Disabled .
Pri	The current PoE priorities for PoE ports, as configured using the power-inline priority command: • Low is the lowest priority (this is the default). • High is the second highest priority. • Crit (critical) is the highest priority. If the switch cannot supply all ports, it will supply critical ports, then high-priority ports, then low-priority ports.
Oper	The current PoE port state when this command was issued: • Powered displays if there is a PD connected and power is being supplied. • Denied displays if supplying power would make the switch go over the power budget. • Off displays if the port is not supplying power but has not been denied power by the switch. This is the default state for ports that are not connected to a PD. • Disabled displays if the PoE port is administratively disabled. • Syncing displays if PoE is still initializing the port when you issue the command. • Fault displays if there is a problem with PoE on the port. • Unknown displays if PoE cannot determine the state of the port.
Power	The power consumption in milliwatts (mW) for the PoE port when this command was entered.
Device	The description of the connected PD device if a description has been added with the power-inline description command. No description is shown for PDs not configured with the power-inline description command.
Class	The class of the connected PD, if power is being supplied to the PD.
Max (mW)	The power in milliwatts (mW) allocated for the PoE port. Additionally, note the following as displayed per PoE port: • [U] if the power limit for a port was user configured (with the power-inline max command).

Parameter	Description
	• [L] if the power limit for a port was supplied by LLDP. • [C] if the power limit for a port was supplied by the PD class. • [A] if the power limit for a port was supplied by autoclass.
HANP	Whether High Availability Network Power is enabled (on) or not (off) on the port. HANP is also known as Continuous PoE. Continuous PoE enables the switch to perform actions such as software upgrades without forcing the Powered Devices to power cycle. This allows, for example, IP cameras to buffer data instead of losing it. This column only displays if Continuous PoE has been enabled globally on the switch.

Related commands [show power-inline counters](#)
[show power-inline interface](#)

Command changes Version 5.4.8-0.2: added to x550 series products

show power-inline counters

Overview This command displays Power over Ethernet (PoE) event counters for ports on the Power Sourcing Equipment (PSE). The PoE event counters displayed can also be accessed by objects in the PoE MIB (RFC 3621). See [the MIB Objects Feature Overview and Configuration Guide](#) for information about which PoE MIB objects are supported.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show power-inline counters [*<port-list>*]

Parameter	Description
<i><port-list></i>	Enter the PoE port(s) to display PoE event counters for them.

Mode User Exec and Privileged Exec

Examples To display all PoE event counters for all PoE ports, use the command:

```
awplus# show power-inline counters
```

To display the PoE event counters for port1.0.1, use the command:

```
awplus# show power-inline counters port1.0.1
```

Output The following shows typical output.

Example output from the show power-inline counters command

```
awplus#show power-inline counters

PoE Counters:
Interface/      MPSAbsent Overload Short   Invalid   Denied
  Pair
port1.0.1/D    0          0         0         0         0
port1.0.1/S    0          0         0         0         0
port1.0.2/D    0          0         0         0         0
port1.0.2/S    0          0         0         0         0
port1.0.3/D    0          0         0         0         0
...
```

Parameters in the show power-inline counters command output

Parameter	Description
Interface	The PoE port(s) in the format port1.0.z, where z is the port number. After the port number, "/D" indicates the data pair and "/S" indicates the spare pair (for ports that support PoE++).
MPSAbsent	The number of instances when the PoE MPS (Maintain Power Signature) signal has been lost. The PoE MPS signal is lost when a PD is disconnected from the PSE. Also increments pethPsePortMPSAbsentCounter in the PoE MIB.
Over load	The number of instances when a PD exceeds its configured power limit (as configured by the power-inline max command). Also increments pethPsePortOverLoadCounter in the PoE MIB.
Short	The number of short circuits that have happened with a PD. Also increments pethPsePortShortCounter in the PoE MIB.
Invalid	The number of times a PD with an Invalid Signature (where the PD has an open or short circuit, or is a legacy PD) is detected. Also increments pethPseInvalidSignatureCounter in the PoE MIB.
Denied	The number of times a PD has been refused power due to power budget limitations for the PSE. Also increments pethPsePortPowerDeniedCounter in the PoE MIB.

Related commands [clear power-inline counters interface](#)
[show power-inline](#)
[show power-inline interface](#)

Command changes Version 5.4.8-0.2: added to x550 series products

show power-inline interface

Overview This command displays a summary of Power over Ethernet (PoE) information for specified ports. If no ports are specified then PoE information is displayed for all ports.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show power-inline interface [*<port-list>*]

Parameter	Description
<i><port-list></i>	Enter the PoE port(s) to display PoE specific information in the show output.

Mode User Exec and Privileged Exec

Example To display the PoE port-specific information for all PoE ports on the switch, use the following command:

```
awplus# show power-inline interface
```

To display the PoE port specific information for port1.0.1 to port1.0.3, use the following command:

```
awplus# show power-inline interface port1.0.1-port1.0.3
```

Output The following shows typical output.

Example output from show power-inline interface

```
show power-inline interface
```

Interface/ Pair	Admin	Pri	Oper	Power (mW)	Device	Class	Max (mW)	
port1.0.1/D	Enabled	Low	Powered	3271	n/a	4	30000	[C]
port1.0.2/D	Enabled	Low	Off	0	n/a	n/a	n/a	
port1.0.3/D	Enabled	Low	Off	0	n/a	n/a	n/a	
port1.0.4/D	Enabled	Low	Off	0	n/a	n/a	n/a	
...								

Parameters in show power-inline interface output

Parameter	Description
Interface	The PoE port(s) in the format port1.0.z, where z is the port number. After the port number, “/D” indicates the data pair and “/S” indicates the spare pair (for ports that support PoE++).
Admin	The administrative state of PoE on a PoE port, either Enabled or Disabled .
Pri	The current PoE priorities for PoE ports on the PSE, as configured from a power-inline priority command: Low displays when the low parameter is issued. The lowest priority for a PoE enabled port (default). High displays when the high parameter is issued. The second highest priority for a PoE enabled port. Crit displays when the critical parameter is issued. The highest priority for a PoE enabled port.
Oper	The current PoE port state when this command was issued: Powered displays if there is a PD connected and power is being supplied. Denied displays if supplying power would make the switch go over the power budget. Off displays if the port is not supplying power but has not been denied power by the switch. This is the default state for ports that are not connected to a PD. Disabled displays if the PoE port is administratively disabled. Syncing displays if PoE is still initializing the port when you issue the command. Fault displays if there is a problem with PoE on the port. Unknown displays if PoE cannot determine the state of the port.

Parameter	Description
Power	The power consumption in milliwatts (mW) for the PoE port when this command was entered.
Device	The description of the connected PD, if a description has been added with the power-inline description command. No description is shown for PDs not configured with the power-inline description command.
Class	The class of the connected PD, if power is being supplied to the PD from the PSE. See the PoE Feature Overview and Configuration Guide for further information about power classes.
Max (mW)	The power in milliwatts (mW) allocated for the PoE port. Additionally, note the following is displayed per PoE port: • [U] if the power limit for a port was user configured (with the power-inline max command). • [L] if the power limit for a port was supplied by LLDP. • [C] if the power limit for a port was supplied by the PD class. • [A] if the power limit for a port was supplied by autoclass.
HANP	Whether High Availability Network Power is enabled (on) or not (off) on the port. HANP is also known as Continuous PoE. It enables the switch to perform actions such as software upgrades without forcing the Powered Devices to power cycle. This allows, for example, IP cameras to buffer data instead of losing it. This column only displays if Continuous PoE has been enabled globally on the switch.

Related commands [show power-inline](#)
[show power-inline interface detail](#)

Command changes Version 5.4.8-0.2: added to x550 series products

show power-inline interface detail

Overview This command displays detailed information for one or more Power over Ethernet (PoE) ports.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show power-inline interface [*<port-list>*] detail

Parameter	Description
<i><port-list></i>	Enter the PoE port(s) to display information about only the specified port or ports.

Mode User Exec and Privileged Exec

Usage notes The power allocated to each port is listed in the **Power allocated** row, and is limited by the maximum power per Powered Device (PD) class, or a user configured power limit.

Examples To display detailed PoE port specific information for the port range port1.0.1 to port1.0.2, use the command:

```
awplus# show power-inline interface port1.0.1-port1.0.2 detail
```


Output The following shows typical output.

Example output from show power-inline interface detail

```
awplus#show power-inline interface port1.0.1 detail
Interface port1.0.1/D
  Powered device type: n/a
  PoE admin: on
  Configured Priority: Low
  Actual Priority: Low
  Detection status: Powered
  Current power consumption: 3432 mW
  Powered device class: 4
  Power allocated: 30000 mW (from powered device class)
  Powered pairs: Data
  Autoclass: No
```

Parameters in show power-inline interface detail output

Parameter	Description
Interface	The PoE port(s) in the format port1.0.z, where z is the port number. After the port number, "/D" indicates the data pair and "/S" indicates the spare pair (for ports that support PoE++).
Powered device type	The name of the PD, if connected and if power is being supplied to the PD from the PSE, configured with the power-inline description command. n/a displays if a description has not been configured for the PD.
PoE admin	The administrative state of PoE on a PoE capable port, either Enabled or Disabled as configured from the power-inline enable command or the no power-inline enable command respectively.
Priority	The PoE priority of a port, which is either Low , or High , or Critical , as configured by the power-inline priority command.
Detection status	The current PSE PoE port state when this command was issued: • Powered displays when there is a PD connected and power is being supplied from the PSE. • Denied displays when supplying power would make the PSE go over the power budget. • Disabled displays when the PoE port is administratively disabled. • Off displays when PoE has been disabled for the port. • Fault displays when a PSE goes over its power allocation.

Parameter	Description
High Availability Network Power	Whether HANP is enabled or disabled on the port. HANP is also known as Continuous PoE. It enables the switch to perform actions such as software upgrades without forcing the Powered Devices to power cycle. This allows, for example, IP cameras to buffer data instead of losing it. Note that this information is only displayed if Continuous PoE is enabled globally on the switch.
Current power consumption	The power consumption for the PoE port when this command was entered. Note that the power consumption may have changed since the command was entered and the power is displayed.
Powered device class	The class of the connected PD if connected, and if power is being supplied to the PD from the PSE. See the PoE Feature Overview and Configuration Guide for further information about power classes.
Power allocated	The power in milliwatts (mW) allocated for the PoE port. Additionally, note the following as displayed per PoE port: • [U] if the power limit for a port was user configured (with the power-inline max command). • [L] if the power limit for a port was supplied by LLDP. • [C] if the power limit for a port was supplied by the PD class. • [A] if the power limit for a port was supplied by autoclass.
Detection of legacy devices is ...	The status of legacy PoE detection on the PoE port (enabled or disabled), as configured for the PoE port with the power-inline allow-legacy command. Legacy detection involves measuring for a large capacitance value to confirm the presence of a legacy PD.
Powered pairs	The IEEE 802.3af and IEEE 802.3at standards allow for either data or spare twisted pairs to be used to transfer power to a PD.
Autoclass	On the x320-10GH, whether autoclass is enabled on the port, as set by the power-inline autoclass command.

Related commands [show power-inline](#)
[show power-inline interface](#)

Command changes Version 5.4.8-0.2: added to x550 series products

19

GVRP Commands

- Contents**
- **Introduction** on page 856
 - **clear gvrp statistics** on page 857
 - **debug gvrp** on page 858
 - **gvrp (interface)** on page 860
 - **gvrp dynamic-vlan-creation** on page 862
 - **gvrp enable (global)** on page 864
 - **gvrp registration** on page 865
 - **gvrp timer** on page 866
 - **show debugging gvrp** on page 868
 - **show gvrp configuration** on page 869
 - **show gvrp machine** on page 870
 - **show gvrp statistics** on page 871
 - **show gvrp timer** on page 872

Introduction

- Overview** With Generic VLAN Registration Protocol (GVRP) enabled, the switch can exchange VLAN configuration information with other GVRP enabled switches. VLANs can be dynamically created and managed through trunk ports.
- There is a limit of 400 VLANs supported by the AlliedWare Plus GVRP implementation. VLANs may be numbered 1-4094, but a limit of 400 of these VLANs are supported.
 - MSTP is not supported by the AlliedWare Plus GVRP implementation. GVRP and MSTP are mutually exclusive. STP and RSTP are supported by GVRP.

This chapter provides an alphabetical reference for commands used to configure GVRP. For information about GVRP, including configuration, see the **[GVRP Feature Overview and Configuration Guide](#)**.

clear gvrp statistics

Overview Use this command to clear the GVRP statistics for all switchports, or for a specific switchport.

Syntax `clear gvrp statistics {all|<interface>}`

Parameter	Description
<code>all</code>	Specify all switchports to clear GVRP statistics.
<code><interface></code>	Specify the switchport to clear GVRP statistics.

Mode Privileged Exec

Usage notes Use this command together with the [show gvrp statistics](#) command to troubleshoot GVRP.

Examples To clear all GVRP statistics for all switchport on the switch, enter the command:

```
awplus# clear gvrp statistics all
```

To clear GVRP statistics for switchport interface port1.0.3, enter the command:

```
awplus# clear gvrp statistics port1.0.3
```

Related commands [show gvrp statistics](#)

debug gvrp

Overview Use this command to debug GVRP packets and commands, sending output to the console.

Use the **no** variant of this command to turn off debugging for GVRP packets and commands.

Syntax debug gvrp {all|cli|event|packet}
no debug gvrp {all|cli|event|packet}

Parameter	Description
all	Specifies debugging for all levels.
cli	Specifies debugging for commands.
event	Specified debugging for events.
packet	Specifies debugging for packets.

Mode Privileged Exec and Global Configuration

Examples To enable GVRP on interfaces port1.0.1-port1.0.2, enter the commands:

```
awplus# configure terminal
awplus(config)# gvrp enable
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# gvrp
```

To disable GVRP on interfaces port1.0.1-port1.0.2, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# no gvrp
```

Examples To send debug output to the console for GVRP packets and GVRP commands, and to enable the display of debug output on the console first, enter the commands:

```
awplus# terminal monitor
awplus# configure terminal
awplus(config)# debug gvrp all
```

To send debug output for GVRP packets to the console, enter the commands:

```
awplus# terminal monitor
awplus# configure terminal
awplus(config)# debug gvrp packets
```

To send debug output for GVRP commands to the console, enter the commands:

```
awplus# terminal monitor
awplus# configure terminal
awplus(config)# debug gvrp cli
```

To stop sending debug output for GVRP packets and GVRP commands to the console, and to stop the display of any debug output on the console, enter the commands:

```
awplus# terminal no monitor
awplus# configure terminal
awplus(config)# no debug gvrp all
```

Related commands [show debugging gvrp](#)
[terminal monitor](#)

gvrp (interface)

Overview Use this command to enable GVRP for switchport interfaces.

Use the **no** variant of this command to disable GVRP for switchport interfaces.

Syntax gvrp
no gvrp

Mode Interface Configuration (for switchport interfaces).

Default Disabled by default.

Usage notes Use this command to enable GVRP on switchport interfaces. Note this command does not enable GVRP for the switch. To enable GVRP on switchports use this command in Interface Configuration mode. You must issue a **gvrp enable (global)** command before issuing a **gvrp (interface)** command.

You must enable GVRP on both ends of a link for GVRP to propagate VLANs between links.

NOTE: *MSTP is not supported by the current AlliedWare Plus GVRP implementation. GVRP and MSTP are mutually exclusive. STP and RSTP are supported by GVRP.*

Private VLAN trunk ports are not supported by the current AlliedWare Plus GVRP implementation. GVRP and private VLAN trunk ports are mutually exclusive.

Examples To enable GVRP on interfaces port1.0.1-port1.0.2, enter the commands:

```
awplus# configure terminal
awplus(config)# gvrp enable
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# gvrp
```

To disable GVRP on interfaces port1.0.1-port1.0.2, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# no gvrp
```

Validation **show gvrp configuration**
Commands

Related [gvrp dynamic-vlan-creation](#)
commands [gvrp enable \(global\)](#)

gvrp dynamic-vlan-creation

Overview Use this command to enable dynamic VLAN creation globally for the switch.

Use the **no** variant of this command to disable dynamic VLAN creation globally for the switch.

Syntax gvrp dynamic-vlan-creation
no gvrp dynamic-vlan-creation

Mode Global Configuration

Default Disabled by default.

Usage notes You must enable GVRP on both ends of a link for GVRP to propagate VLANs between links.

You must also enable GVRP globally in Global Configuration mode before enabling GVRP on an interface in Interface Configuration mode. Both of these tasks must occur to create VLANs.

NOTE: *There is limit of 400 VLANs supported by the AlliedWare Plus GVRP implementation. VLANs may be numbered 1-4094, but a limit of 400 of these VLANs are supported.*

Examples Enter the following commands for switches with hostnames switch1 and switch2 respectively, so switch1 propagates VLANs to switch2 and switch2 propagates VLANs to switch1:

Switch1:

```
switch1# configure terminal
switch1(config)# gvrp enable
switch1(config)# gvrp dynamic-vlan-creation
```

Switch2:

```
switch2# configure terminal
switch2(config)# gvrp enable
switch2(config)# gvrp dynamic-vlan-creation
```

To disable GVRP dynamic VLAN creation on the switch, enter the commands:

```
awplus# configure terminal
awplus(config)# no gvrp dynamic-vlan-creation
```

Validation Commands **show gvrp configuration**

Related commands **gvrp enable (global)**

gvrp enable (global)

Overview Use this command to enable GVRP globally for the switch.

Use the **no** variant of this command to disable GVRP globally for the switch.

Syntax gvrp enable
no gvrp enable

Mode Global Configuration

Default Disabled by default.

Usage notes Use this command to enable GVRP on the switch. Note that this command does not enable GVRP on switchports. To enable GVRP on switchports use the **gvrp (interface)** command in Interface Configuration mode. You must issue a **gvrp enable (global)** command before issuing a **gvrp (interface)** command.

You must enable GVRP on both ends of a link for GVRP to propagate VLANs between links.

NOTE: *MSTP is not supported by the current AlliedWare Plus GVRP implementation. GVRP and MSTP are mutually exclusive. STP and RSTP are supported by GVRP.*

Private VLAN trunk ports are not supported by the current AlliedWare Plus GVRP implementation. GVRP and private VLAN trunk ports are mutually exclusive.

Examples To enable GVRP for the switch, before enabling GVRP on switchports, enter the commands:

```
awplus# configure terminal
awplus(config)# gvrp enable
```

To disable GVRP on the switch, which will also disable GVRP enabled on switchports, enter the commands:

```
awplus# configure terminal
awplus(config)# no gvrp enable
```

Validation Commands **show gvrp configuration**

Related commands **gvrp (interface)**
gvrp dynamic-vlan-creation

gvrp registration

Overview Use this command to set GVRP registration to normal, fixed, and forbidden registration modes.

Use the **no** variant of this command to disable GVRP registration.

Syntax gvrp registration {normal|fixed|forbidden}
no gvrp registration {normal|fixed|forbidden}

Parameter	Description
normal	Specify dynamic GVRP registration and deregistration of VLANs.
fixed	Specify fixed GVRP registration and deregistration of VLANs.
forbidden	Specify no GVRP registration of VLANs. VLANs are deregistered.

Mode Interface Configuration

Default Normal registration is the default.

Usage notes Configuring a trunk port in normal registration mode allows dynamic creation of VLANs. Normal mode is the default mode. Validate using the **show gvrp configuration** command.

Configuring a trunk port in fixed registration mode allows manual creation of VLANs.

Configuring a trunk port in forbidden registration mode prevents VLAN creation on the port.

Examples To configure GVRP registration to fixed on port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# gvrp registration fixed
```

To disable GVRP registration on interfaces port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no gvrp registration
```

Validation Commands **show gvrp configuration**

gvrp timer

Overview Use this command to set GVRP timers in Interface Configuration mode for a given interface.

Use the **no** variant of this command to reset the GVRP timers to the defaults specified in the table below.

Syntax `gvrp timer {join <timer-value>|leave <timer-value>|leaveall <timer-value>}`
`no gvrp timer {join|leave|leaveall}`

Parameter	Description
join	Specifies the timer for joining the group (default is 20 centiseconds / hundredths of a second, or 200 milliseconds).
leave	Specifies the timer for leaving a group (default is 60 centiseconds / hundredths of a second, or 600 milliseconds).
leaveall	Specifies the timer for leaving all groups (default is 1000 centiseconds / hundredths of a second, or 10,000 milliseconds).
<timer-value>	<1-65535> The timer value in hundredths of a second (centiseconds).

Mode Interface Configuration

Defaults The default join time value is 20 centiseconds (200 milliseconds), the default leave timer value is 60 centiseconds (600 milliseconds), and the default leaveall timer value is 1000 centiseconds (10,000 milliseconds).

Usage notes When configuring the leave timer, set it to more than or equal to three times the join timer value. The settings for the leave and join timers must be the same for all GVRP enabled switches. See also the section “Setting the GVRP Timers” in the [GVRP Feature Overview and Configuration Guide](#).

Use the [show gvrp timer](#) command to confirm GVRP timers set with this command.

Examples To set the GVRP join timer to 30 hundredths of a second (300 milliseconds) for interface port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# gvrp timer join 30
```

To set the GVRP leave timer to 90 hundredths of a second (900 milliseconds) for interface port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# gvrp timer leave 90
```

To reset the GVRP join timer to its default of 20 hundredths of a second for interface port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no gvrp timer join
```

Related commands [show gvrp timer](#)

show debugging gvrp

Overview Use this command to see what debugging is turned on for GVRP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging gvrp

Mode User Exec and Privileged Exec

Example Enter the following commands to display GVRP debugging output on the console:

```
awplus# configure terminal
awplus(config)# debug gvrp all
awplus(config)# exit
awplus# show debugging gvrp
```

Output See sample output from the **show debugging gvrp** command after entering **debug gvrp all**:

```
GVRP debugging status:
GVRP Event debugging is on
GVRP CLI debugging is on
GVRP Timer debugging is on
GVRP Packet debugging is on
```

Related commands [debug gvrp](#)

show gvrp configuration

Overview Use this command to display GVRP configuration data for a switch.
For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show gvrp configuration

Mode User Exec and Privileged Exec

Example To show GVRP configuration for the switch, enter the command:
awplus# show gvrp configuration

Output The following is an output of this command displaying the GVRP configuration for a switch:

```
awplus#show gvrp configuration
Global GVRP Configuration:
GVRP Feature: Enabled
Dynamic Vlan Creation: Disabled
Port based GVRP Configuration:

```

Port	GVRP Status	Registration	Applicant	Timers(centiseconds)		
				Join	Leave	LeaveAll
port1.0.1	Enabled	Normal	Normal	20	60	1000
port1.0.2	Enabled	Normal	Normal	200	600	10000

show gvrp machine

Overview Use this command to display the state machine for GVRP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show gvrp machine

Mode User Exec and Privileged Exec

Example To show the GVRP state machine for the switch, enter the command:

```
awplus# show gvrp machine
```

Output See the following output of this command displaying the GVRP state machine.

```
awplus show gvrp machine
port = 1.0.1 applicant state = QA registrar state = INN
port = 1.0.2 applicant state = QA registrar state = INN
```

show gvrp statistics

Overview Use this command to display a statistical summary of GVRP information for the switch.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show gvrp statistics [<interface>]

Parameter	Description
<interface>	The name of the switchport interface.

Mode User Exec and Privileged Exec

Usage notes Use this command together with the **[clear gvrp statistics](#)** command to troubleshoot GVRP.

Examples To show the GVRP statistics for all switchport interfaces, enter the command:

```
awplus# show gvrp statistics
```

To show the GVRP statistics for switchport interfaces port1.0.1 and port1.0.2, enter the command:

```
awplus# show gvrp statistics port1.0.1-port1.0.2
```

Output The following is an output of this command displaying a statistical summary for port1.0.1-port1.0.2

awplus#	show gvrp statistics port1.0.1-port1.0.2					
Port	JoinEmpty	JoinIn	LeaveEmpty	LeaveIn	Empty	
1.0.1	RX	0	2	0	0	0
	TX	0	0	0	0	0
1.0.2	RX	0	1	0	0	1
	TX	0	0	0	0	0

Related commands **[clear gvrp statistics](#)**

show gvrp timer

Overview Use this command to display data for the GVRP timers set with the **gvrp timer** command.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show gvrp timer <interface>

Parameter	Description
<interface>	The name of the switchport interface.

Mode User Exec and Privileged Exec

Examples To show the GVRP timers for all switchport interfaces, enter the command:

```
awplus# show gvrp timer
```

To show the GVRP timers for switchport interface port1.0.1, enter the command:

```
awplus# show gvrp timer port1.0.1
```

Output The following show output displays data for timers on the switchport interface port1.0.1

awplus# show gvrp timer port1.0.1	
Timer	Timer Value (centiseconds)

Join	20
Leave	60
Leave All	1000

Related commands **gvrp timer**

Part 3: Layer 3 Switching

20 IP Addressing and Protocol Commands

- Contents**
- **Introduction** on page 876
 - **arp-aging-timeout** on page 877
 - **arp-mac-disparity** on page 878
 - **arp** on page 881
 - **arp log** on page 883
 - **arp opportunistic-nd** on page 887
 - **arp-loose-check** on page 888
 - **arp-reply-bc-dmac** on page 890
 - **clear arp-cache** on page 891
 - **debug ip packet interface** on page 892
 - **debug ip irdp** on page 895
 - **ip address (IP Addressing and Protocol)** on page 897
 - **ip directed-broadcast** on page 899
 - **ip forwarding** on page 902
 - **ip forward-protocol udp** on page 903
 - **ip gratuitous-arp-link** on page 905
 - **ip helper-address** on page 907
 - **ip irdp** on page 909
 - **ip icmp error-interval** on page 910
 - **ip icmp-timestamp** on page 911
 - **ip irdp address preference** on page 912
 - **ip irdp broadcast** on page 913
 - **ip irdp holdtime** on page 914
 - **ip irdp lifetime** on page 915
 - **ip irdp maxadvertinterval** on page 916
 - **ip irdp minadvertinterval** on page 918
 - **ip irdp multicast** on page 920
 - **ip irdp preference** on page 921
 - **ip limited-local-proxy-arp** on page 923
 - **ip local-proxy-arp** on page 924
 - **ip proxy-arp** on page 926
 - **ip redirects** on page 927
 - **ip tcp synack-retries** on page 928
 - **ip tcp-timestamp** on page 929
 - **ip unreachable** on page 930
 - **local-proxy-arp** on page 933
 - **optimistic-nd** on page 934

- **ping** on page 935
- **platform multicast-address-mismatch-action** on page 936
- **router ip irdp** on page 938
- **show arp** on page 939
- **show debugging ip packet** on page 941
- **show ip flooding-nexthops** on page 943
- **show ip forwarding** on page 944
- **show ip interface** on page 945
- **show ip irdp** on page 946
- **show ip irdp interface** on page 947
- **show ip sockets** on page 950
- **show ip traffic** on page 954
- **tcpdump** on page 956
- **traceroute** on page 957
- **undebg ip packet interface** on page 958
- **undebg ip irdp** on page 959

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure various IP features, including the following protocols:

- Address Resolution Protocol (ARP)
- ICMP Router Discovery Advertisements (IRDP)

For more information, see the **IP Feature Overview and Configuration Guide**.

arp-aging-timeout

Overview This command sets a timeout period on dynamic ARP entries associated with a specific interface. If your device stops receiving traffic for the host specified in a dynamic ARP entry, it deletes the ARP entry from the ARP cache after this timeout is reached.

Your device times out dynamic ARP entries to ensure that the cache does not fill with entries for hosts that are no longer active. Static ARP entries are not aged or automatically deleted.

By default the time limit for dynamic ARP entries is 300 seconds on all interfaces.

The **no** variant of this command sets the time limit to the default of 300 seconds.

Syntax arp-aging-timeout <0-432000>
no arp-aging timeout

Parameter	Description
<0-432000>	The timeout period in seconds.

Default 300 seconds (5 minutes)

Mode Interface Configuration for a VLAN interface.

Example To set the ARP entries on interface vlan2 to time out after two minutes, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# arp-aging-timeout 120
```

Related commands [clear arp-cache](#)
[show arp](#)

arp-mac-disparity

Overview Use this command to enable the switch to support services like Microsoft Network Load Balancing (MS-NLB).

Such services use ARP with disparate MAC addresses to ensure that packets destined for a server cluster virtual address are sent to all servers in the cluster. Disparate MAC addresses mean that the MAC address in the “sender hardware address” field of an ARP reply is different to the MAC address in the “Source MAC address” field of the Ethernet header that the ARP packet is encapsulated in.

The **no** variant of this command reverts to the default behavior. See the Default section below for more information.

Syntax `arp-mac-disparity {multicast|multicast-igmp|unicast}`
`no arp-mac-disparity {multicast|multicast-igmp|unicast}`

Parameter	Description
multicast	Enables support of server clusters operating in multicast mode. Packets destined for the server cluster are flooded to all ports in the VLAN.
multicast-igmp	Enables support of server clusters operating in multicast/IGMP mode. In multicast/IGMP mode, the MS-NLB server cluster uses IGMP reports to forward server traffic to a limited set of ports.
unicast	Enables support of server clusters operating in unicast mode. Packets destined for the server cluster are flooded to all ports in the VLAN.

Default The default behavior upon receiving a Disparate ARP response depends on whether **arp-mac-disparity multicast** or **arp-mac-disparity multicast-igmp** has been configured on an interface.

- If one of these has been configured, then the default action is to flood the packets.
- If neither of these has been configured, then the default action is to drop the packets.
- The command **platform multicast-address-mismatch-action {drop|bridge}** overrides the default behavior regardless of the arp-mac-disparity configuration. An action of **bridge** will cause disparate ARPs to be flooded.

Mode Interface Configuration for a VLAN interface.

Usage notes **Disabling L2 load balancing**

You cannot use the command **arp-mac-disparity** if L2 load balancing is enabled, due to a hashing incompatibility. Use the command **no platform load-balancing src-dst-mac** to turn off L2 load balancing.

Multicast mode

When you are using **multicast** mode, you can limit the number of ports that packets are flooded to, instead of flooding to all ports in the VLAN. To do this, specify the list of ports when creating the ARP entry.

For example, to flood only port1.0.1 to port1.0.3, use the commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
awplus(config)# interface vlan2
awplus(config-if)# arp-mac-disparity multicast
awplus(config-if)# arp 10.10.1.100
010e.11ff.2222 port1.0.1-port1.0.3
```

Multicast IGMP mode

You can enable Multicast-IGMP mode by using the command **arp-mac-disparity multicast-igmp**.

In this mode, the only difference to standard multicast mode is that the reception of IGMP reports now controls the ports to which the L3 switch floods traffic. That is, rather than simply flooding each packet destined for the NLB cluster IP address to all ports on the egress VLAN, those packets are only sent to the switchports in the VLAN that have received IGMP reports for the multicast group corresponding to the NLB cluster MAC address.

Like **arp-mac-disparity multicast**, the command **arp-mac-disparity multicast-igmp** puts the switch into a mode where it will accept Disparate ARP responses. Similarly, upon receiving a Disparate ARP response, an ARP entry is created for the IP/MAC in the content of the ARP packet. The difference with the **arp-mac-disparity multicast-igmp** command is that the egress port is set to the subset of ports in the VLAN that have received IGMP reports for the NLB cluster MAC address.

Note that the ARP entry is updated as ports join/leave the IGMP group. If no ports have received IGMP reports for the NLB cluster MAC address then the ARP entry will have no egress ports and will simply drop packets destined for the NLB cluster IP address.

Again, no FDB entry is created in response to receiving the ARP packet. However, since the NLB server is operating in multicast mode with the IGMP option set and is sending IGMP reports, an FDB entry will already exist for the IGMP group (and, as a result, the NLB cluster MAC address).

When the **arp-mac-disparity multicast-igmp** command is configured on the VLAN, ARP entries appear in the output of the command **show arp** like this:

```
awplus#show arp
```

IP Address	MAC Address	Interface	Port	Type
10.100.0.56	0100.5e7f.0038	vlan200	igmp-group	dynamic

Examples To enable support for MS-NLB in unicast mode on interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# no platform load-balancing src-dst-mac
awplus(config)# interface vlan2
awplus(config-if)# arp-mac-disparity unicast
```

To disable support for MS-NLB in unicast mode on interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no arp-mac-disparity unicast
```

Related commands

- arp**
- clear arp-cache**
- platform load-balancing**
- platform multicast-address-mismatch-action**
- show arp**

arp

Overview This command adds a static ARP entry to the ARP cache. This is typically used to add entries for hosts that do not support ARP or to speed up the address resolution function for a host. The ARP entry must not already exist. Use the **alias** parameter to allow your device to respond to ARP requests for this IP address.

The **no** variant of this command removes the static ARP entry. Use the **clear arp-cache** to remove the dynamic ARP entries in the ARP cache.

Syntax `arp <ip-addr> <mac-address> [<port-number>] [alias]`
`arp <ip-addr> <multicast-mac-address> [<port-list>]`
`no arp <ip-addr>`

Parameter	Description
<code><ip-addr></code>	The IPv4 address of the device you are adding as a static ARP entry.
<code><mac-address></code>	The MAC address of the device you are adding as a static ARP entry, in hexadecimal notation with the format HHHH.HHHH.HHHH.
<code><port-number></code>	The port number associated with the IP address. Specify this when the IP address is part of a VLAN.
<code><multicast-mac-address></code>	The multicast MAC address for which you are adding a static ARP entry, in hexadecimal notation with the format HHHH.HHHH.HHHH.
<code><port-list></code>	The list of port numbers associated with the IP address. You can only specify multiple egress ports when the MAC address is a multicast MAC address.
<code>alias</code>	Allows your device to respond to ARP requests for the IP address. Proxy ARP must be enabled on the interface before using this parameter.

Mode Global Configuration

Usage notes One use of this command is to limit packet flooding when using services like Microsoft Network Load Balancing (MS-NLB). With such services, packets destined for server cluster virtual address must be sent to all servers in the cluster. The server cluster can operate in multicast mode, in which it uses a multicast MAC address. To support this, this command allows you to create a static ARP entry with a multicast MAC address, and specify which ports the packets will be forwarded out.

Creating a static ARP entry enables the switch to correctly forward server cluster traffic. If you want the switch to also respond to pings from the server cluster, you need to also enable server cluster support, using the **arp-mac-disparity** command.

Examples To add the IP address 10.10.10.9 with the MAC address 0010.2533.4566 into the ARP cache, and have your device respond to ARP requests for this address, use the commands:

```
awplus# configure terminal
awplus(config)# arp 10.10.10.9 0010.2533.4566 alias
```

Related commands

- arp-mac-disparity**
- clear arp-cache**
- ip proxy-arp**
- show arp**

arp log

Overview This command enables the logging of dynamic and static ARP entries in the ARP cache. The ARP cache contains mappings of device ports, VLAN IDs, and IP addresses to physical MAC addresses for hosts.

This command can display the MAC addresses in the ARP log either using the notation HHHH.HHHH.HHHH, or using the IEEE standard hexadecimal notation (HH-HH-HH-HH-HH-HH).

Use the **no** variant of this command to disable the logging of ARP entries.

Syntax `arp log [mac-address-format ieee]`
`no arp log [mac-address-format ieee]`

Parameter	Description
<code>mac-address-format ieee</code>	Display the MAC address in the standard IEEE format (HH-HH-HH-HH-HH-HH), instead of displaying the MAC address with the format HHHH.HHHH.HHHH.

Default The ARP logging feature is disabled by default.

Mode Global Configuration

Usage notes You have the option to change how the MAC address is displayed in the ARP log message. The output can either use the notation HHHH.HHHH.HHHH or HH-HH-HH-HH-HH-HH.

Enter **arp log** to use HHHH.HHHH.HHHH notation.

Enter **arp log mac-address-format ieee** to use HH-HH-HH-HH-HH-HH notation.

Enter **no arp log mac-address-format ieee** to revert from HH-HH-HH-HH-HH-HH to HHHH.HHHH.HHHH.

Enter **no arp log** to disable ARP logging.

To display ARP log messages use the command **show log | include ARP_LOG**.

Examples To enable ARP logging and specify that the MAC address in the log message is displayed in HHHH.HHHH.HHHH notation, use the following commands:

```
awplus# configure terminal
awplus(config)# arp log
```

To disable ARP logging on the device, use the following commands:

```
awplus# configure terminal
awplus(config)# no arp log
```

To enable ARP logging and specify that the MAC address in the log message is displayed in the standard IEEE format hexadecimal notation (HH-HH-HH-HH-HH-HH), use the following commands:

```
awplus# configure terminal
awplus(config)# arp log mac-address-format ieee
```

To leave ARP logging enabled, but stop using HH-HH-HH-HH-HH-HH format and use HHHH.HHHH.HHHH format instead, use the following commands:

```
awplus# configure terminal
awplus(config)# no arp log mac-address-format ieee
```

To display ARP log messages, use the following command:

```
awplus# show log | include ARP_LOG
```


Output The following shows typical output.

Output from show log | include ARP_LOG after enabling ARP logging using arp log. Note that this output uses HHHH.HHHH.HHHH format.

```
awplus#configure terminal
awplus(config)#arp log
awplus(config)#exit
awplus#show log | include ARP_LOG
2022 Mar 6 06:21:01 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 add
0013.4078.3b98 (192.168.2.4)
2022 Mar 6 06:22:30 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 del
0013.4078.3b98 (192.168.2.4)
2022 Mar 6 06:23:26 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 add
0030.940e.136b (192.168.2.20)
2022 Mar 6 06:23:30 user.notice awplus IMISH[1830]: show log | include ARP_LOG
```

Output from show log | include ARP_LOG after enabling ARP logging using arp log mac-address format ieee. Note that this output uses HH-HH-HH-HH-HH-HH format.

```
awplus#configure terminal
awplus(config)#arp log mac-address-format ieee
awplus(config)#exit
awplus#show log | include ARP_LOG
2022 Mar 6 06:25:28 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 add
00-17-9a-b6-03-69 (192.168.2.12)
2022 Mar 6 06:25:30 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 add
00-03-37-6b-a6-a5 (192.168.2.10)
2022 Mar 6 06:26:53 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 del
00-30-94-0e-13-6b (192.168.2.20)
2022 Mar 6 06:27:31 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 del
00-17-9a-b6-03-69 (192.168.2.12)
2022 Mar 6 06:28:09 user.notice awplus HSL[1007]: ARP_LOG port1.0.1 vlan1 del
00-03-37-6b-a6-a5 (192.168.2.10)
2022 Mar 6 06:28:14 user.notice awplus IMISH[1830]: show log | include ARP_LOG
```

The following table lists the parameters shown in the output of the **show log | include ARP_LOG** command. The ARP log message format is:

<date> <time> <severity> <hostname> <program-name>
ARP_LOG <port-number> <vid> <operation> <MAC> <IP>

Parameters in the output from show log | include ARP_LOG

Parameter	Description
ARP_LOG	Indicates that ARP log entry information follows.
<port-number>	Indicates device port number for the ARP log entry.
<vid>	Indicates the VLAN ID for the ARP log entry.
<operation>	Indicates “add” if the ARP log entry displays an ARP addition. Indicates “del” if the ARP log entry displays an ARP deletion.
<MAC>	Indicates the MAC address for the ARP log entry, either in the default hexadecimal notation (HHHH.HHHH.HHHH) or in the IEEE standard format hexadecimal notation (HH-

Parameter	Description
	HH-HH-HH-HH-HH) as specified with the arp log or the arp log mac-address-format ieee command.
<IP>	Indicates the IP address for the ARP log entry.

Related commands [show log](#)
[show running-config](#)

arp opportunistic-nd

Overview Use this command to enable opportunistic neighbor discovery for the global ARP cache. This command changes the behavior for unsolicited ARP packet forwarding on the device.



CAUTION: *Opportunistic neighbor discovery can make your device more vulnerable to ARP/ND cache poisoning attacks. We recommend disabling it unless necessary.*

Use the **no** variant of this command to disable opportunistic neighbor discovery for the global ARP cache.

Syntax arp opportunistic-nd
no arp opportunistic-nd

Default Opportunistic neighbor discovery is disabled by default.

Mode Global Configuration

Usage notes When opportunistic neighbor discovery is enabled, the device will reply to any received unsolicited ARP packets (but not gratuitous ARP packets). The source MAC address for the unsolicited ARP packet is added to the ARP cache, so the device forwards the ARP packet. When opportunistic neighbor discovery is disabled, the source MAC address for the ARP packet is not added to the ARP cache, so the ARP packet is not forwarded by the device.

Examples To enable opportunistic neighbor discovery for the global ARP cache, enter:

```
awplus# configure terminal
awplus(config)# arp opportunistic-nd
```

To disable opportunistic neighbor discovery for the global ARP cache, enter:

```
awplus# configure terminal
awplus(config)# no arp opportunistic-nd
```

Related commands [ipv6 opportunistic-nd](#)
[show arp](#)
[show running-config interface](#)

arp-loose-check

Overview Use this command to let AlliedWare Plus process ARPs that have a sender protocol address from outside the interface's local subnets.

Use the **no** variant of this command to return to the default ARP processing behavior. By default, AlliedWare Plus will only process ARP packets that are local to the incoming interface.

Syntax arp-loose-check
no arp-loose-check

Default Disabled.

Mode Interface Configuration for VLAN interfaces.

Usage notes By default, AlliedWare Plus will only process ARP packets that are local to the incoming interface, to prevent ARP poisoning. This means the packets must have:

- a sender protocol address inside one of the incoming interface's local subnets, and
- a target protocol address equal to one of the incoming interface's IP addresses.

If you enable loose ARP processing and then use the **no** variant of this command to return to default processing, you may need to clear the ARP cache. Use the **clear arp-cache** command. This will remove any undesired existing ARPs.

You cannot use this command at the same time as Proxy ARP. Proxy ARP also allows AlliedWare Plus to process ARPs that have a sender protocol address from outside the interface's local subnets.

Example To process ARPs that have a sender protocol address from outside vlan2's local subnets, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# arp-loose-check
```

To return to the default behavior on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no arp-loose-check
```

Related commands **arp**
 clear arp-cache
 ip proxy-arp
 show arp

Command changes Version 5.5.2-0.1: command added

arp-reply-bc-dmac

Overview Use this command to allow processing of ARP replies that arrive with a broadcast destination MAC (ffff.ffff.ffff). This makes neighbors reachable if they send ARP responses that contain a broadcast destination MAC.

Use the **no** variant of this command to turn off processing of ARP replies that arrive with a broadcast destination MAC.

Syntax arp-reply-bc-dmac
no arp-reply-bc-dmac

Default By default, this functionality is disabled.

Mode Interface Configuration for VLAN interfaces.

Example To allow processing of ARP replies that arrive on vlan2 with a broadcast destination MAC, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# arp-reply-bc-dmac
```

Related commands [clear arp-cache](#)
[show arp](#)

clear arp-cache

Overview This command deletes dynamic ARP entries from the ARP cache. You can optionally specify the IPv4 address of an ARP entry to be cleared from the ARP cache.

Syntax clear arp-cache [*<ip-address>*]

Parameter	Description
<i><ip-address></i>	The IPv4 address of an ARP entry that is to be cleared from the ARP cache.

Mode Privileged Exec

Usage notes To display the entries in the ARP cache, use the [show arp](#) command. To remove static ARP entries, use the no variant of the [arp](#) command.

Example To clear all dynamic ARP entries, use the command:

```
awplus# clear arp-cache
```

To clear all dynamic ARP entries associated with the IPv4 address 192.168.1.1, use the command:

```
awplus# clear arp-cache 192.168.1.1
```

Related commands [arp-mac-disparity](#)
[arp](#)
[show arp](#)

debug ip packet interface

Overview The **debug ip packet interface** command enables IP packet debug and is controlled by the **terminal monitor** command.

If the optional **icmp** keyword is specified then ICMP packets are shown in the output.

The **no** variant of this command disables the **debug ip packet interface** command.

Syntax debug ip packet interface {<interface-name>|all} [address <ip-address>|verbose|hex|arp|udp|tcp|icmp]
no debug ip packet interface [<interface-name>]

Parameter	Description
<interface-name>	Specify a single Layer 3 interface name (not a range of interfaces) This keyword can be specified as either all or as a single Layer 3 interface to show debugging for either all interfaces or a single interface.
all	Specify all Layer 3 interfaces on the device.
<ip-address>	Specify an IPv4 address. If this keyword is specified, then only packets with the specified IP address as specified in the ip-address placeholder are shown in the output.
verbose	Specify verbose to output more of the IP packet. If this keyword is specified then more of the packet is shown in the output.
hex	Specify hex to output the IP packet in hexadecimal. If this keyword is specified, then the output for the packet is shown in hex.
arp	Specify arp to output ARP protocol packets. If this keyword is specified, then ARP packets are shown in the output.
udp	Specify udp to output UDP protocol packets. If this keyword is specified then UDP packets are shown in the output.
tcp	Specify tcp to output TCP protocol packets. If this keyword is specified, then TCP packets are shown in the output.
icmp	Specify icmp to output ICMP protocol packets. If this keyword is specified, then ICMP packets are shown in the output.

Mode Privileged Exec and Global Configuration

Examples To turn on ARP packet debugging on vlan2, use the command:

```
awplus# debug ip packet interface vlan2 arp
```

To turn off IP packet interface debugging on interface vlan2, use the command:

```
awplus# no debug ip packet interface vlan2
```

To turn on all packet debugging on all interfaces on the device, use the command:

```
awplus# debug ip packet interface all
```

To turn off IP packet interface debugging on all interfaces, use the command:

```
awplus# no debug ip packet interface
```

To turn on TCP packet debugging on vlan2 and IP address 192.168.2.4, use the command:

```
awplus# debug ip packet interface vlan2 address 192.168.2.4 tcp
```

Related commands

- [no debug all](#)
- [show debugging ip dns forwarding](#)
- [tcpdump](#)
- [terminal monitor](#)
- [undebug ip packet interface](#)

debug ip irdp

Overview This command enables debugging of ICMP Router Discovery Protocol (IRDP) events and messages on your device. IRDP debugging is disabled by default.

The **no** variant of this command disables IRDP debugging. Negating any packet debug mode will switch detail off.

Syntax `debug ip irdp {event|nsm|receive|send|both|detail|all}`
`no debug ip irdp {event|nsm|receive|send|both|detail|all}`

Parameter Description	
event	Enables debugging of IRDP events.
nsm	Enables debugging of IRDP processing of NSM messages.
receive	Enables debugging of IRDP input packet processing.
send	Enables debugging of IRDP output packet processing.
both	Enables debugging of both IRDP input and output packet processing.
detail	Enables detailed debugging of both IRDP input and output packet processing. Note that setting detail also sets both, so if you set detail , the output will show "packet debugging mode is all". Negating any packet debug mode will switch detail off.
all	Enables all IRDP debugging types.

Default IRDP protocol debugging is disabled by default.

Mode Privileged Exec and Global Configuration

Examples To enable IRDP input packet process debugging, use the following command:

```
awplus# debug ip irdp receive
```

To disable all IRDP debugging, use the following command:

```
awplus# no debug ip irdp all
```

Related commands

- ip irdp**
- router ip irdp**
- show ip irdp**
- undebug ip irdp**

ip address (IP Addressing and Protocol)

Overview This command sets a static IP address on an interface.

The **no** variant of this command removes the IP address from the interface.

You cannot remove the primary address when a secondary address is present.

Syntax `ip address <ip-addr/prefix-length> [secondary] [label <label>]`
`no ip address [<ip-addr/prefix-length>] [secondary]`

Parameter	Description
<ip-addr/prefix-length>	The IPv4 address and prefix length you are assigning to the interface.
secondary	Secondary IP address.
label	Adds a user-defined description of the secondary IP address.
<label>	A user-defined description of the secondary IP address. Valid characters are any printable character and spaces.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes To set the primary IP address on the interface, specify only **ip address** <ip-addr/prefix-length>. This overwrites any configured primary IP address. To add additional IP addresses on this interface, use the **secondary** parameter. You must configure a primary address on the interface before configuring a secondary address.

NOTE: Use `show ip interface`, instead of `show ip address`, when you need to view a secondary address configured on an interface. `show ip address` will only show the primary address, not a secondary address for an interface.

Examples To add the IP address 10.10.10.50/24 to the interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip address 10.10.10.50/24
```

To add the secondary IP address 10.10.11.50/24 to the same interface, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip address 10.10.11.50/24 secondary
```

To add the IP address 10.10.11.50/24 to the local loopback interface lo, use the following commands:

```
awplus# configure terminal
awplus(config)# interface lo
awplus(config-if)# ip address 10.10.11.50/24
```

Related commands **interface (to configure)**
show ip interface
show running-config interface

ip directed-broadcast

Overview Use this command to enable flooding of directed broadcast packets into a directly connected subnet. If this command is configured on an interface, then directed broadcasts received on other interfaces, destined for the subnet on this interface, will be flooded to the subnet broadcast address of this interface.

Optionally, you can use an access-list to specify addresses permitted to send directed broadcast packets into a directly connected subnet. Note that directed broadcast access-lists have an implicit deny, so configuring an empty access-list stops directed broadcast flooding.

Use the **no** variant of this command to disable **ip directed-broadcast**. When this feature is disabled using the **no** variant of this command, directed broadcasts are not forwarded.

Syntax `ip directed-broadcast [<access-list>]`
`no ip directed-broadcast`

Parameter	Description
<code><access-list></code>	A standard software ACL. The ACL defines which addresses are permitted to flood the subnet with a directed broadcast.

Default The **ip directed-broadcast** command is disabled by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes IP directed-broadcast is enabled and disabled per interface. When enabled a directed broadcast packet is forwarded to an enabled interface if received on another subnet.

An IP directed broadcast is an IP packet whose destination address is a broadcast address for some IP subnet, but originates from a node that is not itself part of that destination subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is flooded as a broadcast on the destination subnet.

The **ip directed-broadcast** command controls the flooding of directed broadcasts when they reach target subnets. The command affects the final transmission of the directed broadcast on its destination subnet. It does not affect the transit unicast routing of IP directed broadcasts. If directed broadcast is enabled for an interface, incoming directed broadcast IP packets intended for the subnet assigned to the interface will be flooded as broadcasts on that subnet.

If the **no ip directed-broadcast** command is configured for an interface, directed broadcasts destined for the subnet where the interface is attached will be dropped instead of broadcast.

Examples To enable the flooding of broadcast packets via vlan2, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip directed-broadcast
```

To disable the flooding of broadcast packets via vlan2, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip directed-broadcast
```

To use an ACL to control the flooding of broadcast packets via the interface vlan2, to permit only directed broadcasts from 10.1.1.1/32, use the following commands:

```
awplus# configure terminal
awplus(config)# access-list standard Example-ACL
awplus(config-ip-std-acl)# permit 10.1.1.1/32
awplus(config-ip-std-acl)# exit
awplus(config)# interface vlan2
awplus(config-if)# ip directed-broadcast Example-ACL
```

Related commands **access-list standard (named)**
ip forward-protocol udp
ip helper-address
show running-config

Command changes Version 5.5.5-1.1: **access - list** parameter added

ip forwarding

Overview This command enables IP forwarding on your device. When enabled, your device routes IP packets.

The **no** variant of this command disables IP forwarding on your device. Even when IP forwarding is not enabled, the device can still work as an IP host; in particular, it can be managed by IP-based applications, such as SNMP, Telnet and SSH.

Syntax `ip forwarding`
`no ip forwarding`

Default IP forwarding is enabled by default.

Mode Global Configuration

Examples To enable your device to route IP packets, use the commands:

```
awplus# configure terminal
awplus(config)# ip forwarding
```

To stop your device from routing IP packets, use the commands

```
awplus# configure terminal
awplus(config)# no ip forwarding
```

Related commands [show ip forwarding](#)

ip forward-protocol udp

Overview This command enables you to control which UDP broadcasts will be forwarded to the helper address(es). A UDP broadcast will only be forwarded if the destination UDP port number in the packet matches one of the port numbers specified using this command.

Refer to the IANA site (www.iana.org) for a list of assigned UDP port numbers for protocols to forward using **ip forward-protocol udp**.

Use the **no** variant of this command to remove a port number from the list of destination port numbers that are used as the criterion for deciding if a given UDP broadcast should be forwarded to the IP helper address(es).

Syntax `ip forward-protocol udp <port>`
`no ip forward-protocol udp <port>`

Parameter	Description
<port>	UDP Port Number.

Default The **ip forward-protocol udp** command is not enabled by default.

Mode Global Configuration

Usage notes Combined with the **ip helper-address** in interface mode, the **ip forward-protocol udp** command in Global Configuration mode allows control of which protocols (destination port numbers) are forwarded. The **ip forward-protocol udp** command configures protocols for forwarding, and the **ip helper-address** command configures the destination address(es).

NOTE:

*The types of UDP broadcast packets that the device will forward are ONLY those specified by the **ip forward-protocol** command(s). There are no other UDP packet types that the IP helper process forwards by default.*

*The **ip forward-protocol udp** command does not support BOOTP / DHCP Relay. The **ip dhcp-relay** command must be used instead. For this reason, you may not configure UDP ports 67 and 68 with the **ip forward-protocol udp** command.*

See the **IP Feature Overview and Configuration Guide** for more information about DNS Relay.

Examples To configure forwarding of packets on a UDP port, use the following commands:

```
awplus# configure terminal
awplus(config)# ip forward-protocol udp <port>
```

To delete a UDP port from the UDP ports that the device forwards, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip forward-protocol udp <port>
```

Related commands [ip helper-address](#)
[ip directed-broadcast](#)
[show running-config](#)

ip gratuitous-arp-link

Overview This command sets the Gratuitous ARP time limit for all interfaces. The time limit restricts the sending of Gratuitous ARP packets to one Gratuitous ARP packet within the time in seconds.

The **no** variant of the command sets the Gratuitous ARP time limit to the default.

NOTE: This command specifies time between sequences of Gratuitous ARP packets, and time between individual Gratuitous ARP packets occurring in a sequence, to allow legacy support for older devices and inter-operation between other devices that are not ready to receive and forward data until several seconds after linkup.

Additionally, jitter has been applied to the delay following linkup, so Gratuitous ARP packets applicable to a given port are spread over a period of 1 second so are not all sent at once. Remaining Gratuitous ARP packets in the sequence occur after a fixed delay from the first one.

Syntax ip gratuitous-arp-link <0-300>
no ip gratuitous-arp-link

Parameter	Description
<0-300>	Specify the minimum time between sequences of Gratuitous ARPs and the fixed time between Gratuitous ARPs occurring in a sequence, in seconds. 0 disables the sending of Gratuitous ARP packets. The default is 8 seconds.

Default The default Gratuitous ARP time limit for all interfaces is 8 seconds.

Mode Global Configuration

Usage Every switchport will send a sequence of 3 Gratuitous ARP packets to each VLAN that the switchport is a member of, whenever the switchport moves to the forwarding state. The first Gratuitous ARP packet is sent 1 second after the switchport becomes a forwarding switchport. The second and third Gratuitous ARP packets are each sent after the time period specified by the Gratuitous ARP time limit.

Additionally, the Gratuitous ARP time limit specifies the minimum time between the end of one Gratuitous ARP sequence and the start of another Gratuitous ARP sequence. When a link is flapping, the switchport's state is set to forwarding several times. The Gratuitous ARP time limit is imposed to prevent Gratuitous ARP packets from being sent undesirably often.

Examples To disable the sending of Gratuitous ARP packets, use the commands :

```
awplus# configure terminal
```

```
awplus(config)# ip gratuitous-arp-link 0
```

To restrict the sending of Gratuitous ARP packets to one every 20 seconds, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip gratuitous-arp-link 20
```

Related Commands [show running-config](#)

ip helper-address

Overview Use this command to add a forwarding destination address for IP Helper to enable forwarding of User Datagram Protocol (UDP) broadcasts on an interface.

Use the **no** variant of this command to disable the forwarding of broadcast packets to specific addresses.

Syntax `ip helper-address <ip-addr>`
`no ip helper-address <ip-addr>`

Parameter	Description
<code><ip-addr></code>	Forwarding destination IP address for IP Helper.

Default The destination address for the **ip helper-address** command is not configured by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes Combined with the **ip forward-protocol udp** command in global configuration mode, the **ip helper-address** command in interface mode allows control of which protocols (destination port numbers) are forwarded. The **ip forward-protocol udp** command configures protocols for forwarding, and the **ip helper-address** command configures the destination address(es).

The destination address can be a unicast address or a subnet broadcast address. The UDP destination port is configured separately with the **ip forward-protocol udp** command. If multiple destination addresses are registered then UDP packets are forwarded to each IP address added to an IP Helper. Up to 32 destination addresses may be added using IP Helper.

The device will only forward the types of UDP broadcast packets that are specified by the **ip forward-protocol** command(s). The device does not forward any other UDP packet types by default.

The **ip helper-address** command does not support BOOTP / DHCP Relay. The **service dhcp-relay** command must be used instead. For this reason, you may not configure UDP ports 67 and 68 with the **ip forward-protocol** command.

See the **IP Feature Overview and Configuration Guide** for more information about DHCP Relay.

Examples The following example defines IPv4 address 192.168.1.100 as an IP Helper destination address to which to forward UDP broadcasts received on vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip helper-address 192.168.1.100
```

The following example removes IPv4 address 192.168.1.100 as an IP Helper destination address to which to forward UDP broadcasts received on vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip helper-address 192.168.1.100
```

Related commands [ip forward-protocol udp](#)
[ip directed-broadcast](#)
[show running-config](#)

ip irdp

Overview This command enables ICMP Router Discovery advertising on an interface. However, the interface does not send or process Router Discovery messages until at least one IP address is configured on the interface with the **ip address (IP Addressing and Protocol)** command.

The **no** variant of this command disables ICMP Router Discovery advertisements on an IP interface. All transmitting and processing of Router Discovery messages ceases immediately on the interface.

Syntax ip irdp
no ip irdp

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To enable Router Discovery advertisements on v lan4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan4
awplus(config-if)# ip irdp
```

To disable Router Discovery advertisements on v lan4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan4
awplus(config-if)# no ip irdp
```

Related commands **ip address (IP Addressing and Protocol)**
show ip irdp
show ip irdp interface

ip icmp error-interval

Overview Use this command to limit how often IPv4 ICMP error messages are sent. The maximum frequency of messages is specified in milliseconds. Use the **no** variant of this command to reset the frequency to the default.

Syntax `ip icmp error-interval <interval>`
`no ip icmp error-interval`

Parameter	Description
<interval>	0-2147483647, interval in milliseconds.

Default 1000

Mode Global Configuration

Example To configure the rate to be at most one packet every 10 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip icmp error-interval 10000
```

To reset the rate to the default of one packet every second, use the commands:

```
awplus# configure terminal
awplus(config)# no ip icmp error-interval
```

Related commands [ipv6 icmp error-interval](#)

ip icmp-timestamp

Overview Use this command to allow ICMP timestamp request and response packets.

Use the **no** variant of this command to drop ICMP timestamp request and response packets.

You may wish to drop these packets because the ICMP timestamp response contains the device's date and time. This information could theoretically be used against some systems to exploit weak time-based random number generators in other services. In addition, it may be possible to fingerprint devices by analyzing their responses to invalid ICMP timestamp requests.

Syntax `ip icmp-timestamp`
`no ip icmp-timestamp`

Default Allowed

Mode Global Configuration

Example To drop ICMP timestamp packets, use the commands:

```
awplus# configure terminal
awplus(config)# no ip icmp-timestamp
```

To allow ICMP timestamp packets again, use the commands:

```
awplus# configure terminal
awplus(config)# ip icmp-timestamp
```

Related commands [ip tcp-timestamp](#)

Command changes Version 5.5.2-0.1: command added

ip irdp address preference

Overview When multiple routers connected to a LAN are all sending Router Discovery advertisements, hosts need to be able to choose the best router to use. Therefore the IRDP defines a preference value to place in the Router Discovery advertisements. Hosts choose the router with the highest preference value.

This command sets the preference value to include in Router Discovery advertisements sent for the specified IP address.

The **no** variant of this command sets the preference for a specific address to the default of **0**.

Syntax `ip irdp address <ip-address> preference <0-2147483647>`
`no ip irdp address <ip-address> preference`

Parameter	Description
<ip-address>	The IP address to be advertised with the specified preference value.
<0-2147483647>	The preference value advertised. A higher number increases the preference level for this address.

Default The default preference value is 0.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the preference value to 3000 for the address 192.168.1.1 advertised on vlan5, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan5
awplus(config-if)# ip irdp address 192.168.1.1 preference 3000
```

To set the preference value to the default of 0 for the address 192.168.1.1 advertised on vlan5, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan5
awplus(config-if)# no ip irdp address 192.168.1.1 preference
```

Related commands [ip irdp](#)
[ip irdp preference](#)
[show ip irdp interface](#)

ip irdp broadcast

Overview This command configures broadcast Router Discovery advertisements on an interface. The interface sends IRDP advertisements with the broadcast address (255.255.255.255) as the IP destination address.

The **no** variant of this command configures multicast Router Discovery advertisements on an interface. The interface sends IRDP advertisements with the all-system multicast address (224.0.0.1) as the IP destination address.

Syntax ip irdp broadcast
no ip irdp broadcast

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To enable broadcast Router Discovery advertisements on vlan13, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan13
awplus(config-if)# ip irdp broadcast
```

To enable multicast Router Discovery advertisements on vlan13, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan13
awplus(config-if)# no ip irdp broadcast
```

Related commands [ip irdp](#)
[ip irdp multicast](#)
[show ip irdp interface](#)

ip irdp holdtime

Overview This command sets the maximum length of time that the advertised addresses are to be considered as valid router addresses by hosts.

The **no** variant of this command resets the holdtime back to the default of 1800 seconds.

Syntax ip irdp holdtime <0-9000>
no ip irdp holdtime

Parameter	Description
<0-9000>	The holdtime value in seconds of addresses advertised.

Default The IRDP holdtime is set to 1800 seconds (30 minutes) by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the holdtime value of addresses advertised on v lan2 to 4000 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip irdp holdtime 4000
```

To set the holdtime value of addresses advertised on v lan2 back to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip irdp holdtime
```

Related commands [show ip irdp interface](#)

ip irdp lifetime

Overview This command sets the maximum length of time that hosts should consider the Router Discovery advertised addresses as valid router addresses. If you change the lifetime value, also change the **maxadvertisementinterval** and the **minadvertisementinterval** to maintain the following ratios:

This command is synonymous with the **ip irdp hostname<0-9000>** command.

The **no** variant of this command sets the lifetime back to the default of 1800 seconds.

Syntax `ip irdp lifetime <0-9000>`
`no ip irdp lifetime`

Parameter	Description
<code><0-9000></code>	Lifetime value in seconds of the advertised addresses.

Default The lifetime value is 1800 seconds.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the lifetime value to 4000 seconds for addresses advertised on `vlan6`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan6
awplus(config-if)# ip irdp lifetime 4000
```

To set the lifetime value to the default of 1800 seconds for addresses advertised on `vlan6`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan6
awplus(config-if)# no ip irdp lifetime
```

Related commands [ip irdp](#)
[ip irdp maxadvertinterval](#)
[ip irdp minadvertinterval](#)
[show ip irdp interface](#)

ip irdp maxadvertinterval

Overview This command sets the maximum time allowed between sending router advertisements from the interface. If you change the **maxadvertisementinterval** value, also change the **lifetime** and the **minadvertisementinterval** to maintain the following ratios:

```
lifetime=3 x  
maxadvertisementinterval  
  
minadvertisementinterval=0.75  
x  
maxadvertisementinterval
```

You cannot set the maximum advertisement interval below the minimum interval. If you are lowering the maximum interval to a value below the current minimum interval, you must change the minimum value first.

The **no** variant of this command sets the **maxadvertinterval** back to the default of 600 seconds.

Syntax ip irdp maxadvertinterval <4-1800>
no ip irdp maxadvertinterval

Parameter	Description
<4-1800>	The maximum time, in seconds, between Router Discovery advertisements.

Default The IRDP maximum advertisement interval is set to 600 seconds (10 minutes) by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the maximum interval between Router Discovery advertisements on vlan7 to 950 seconds, use the following commands:

```
awplus# configure terminal  
awplus(config)# interface vlan7  
awplus(config-if)# ip irdp maxadvertinterval 950
```

To set the maximum interval between advertisements on vlan7 back to the default, use the following commands:

```
awplus# configure terminal  
awplus(config)# interface vlan7  
awplus(config-if)# no ip irdp maxadvertinterval
```


Related commands

- ip irdp**
- ip irdp lifetime**
- ip irdp minadvertinterval**
- show ip irdp interface**

ip irdp minadvertinterval

Overview This command sets the minimum time allowed between sending router advertisements from the interface. If you change the **minadvertisementinterval** value, also change the **lifetime** and the **maxadvertisementinterval** to maintain the following ratios:

```
lifetime=3 x
maxadvertisementinterval

minadvertisementinterval=0.75
x
maxadvertisementinterval
```

You cannot set the minimum advertisement interval above the maximum interval. If you are raising the minimum interval to a value above the current maximum interval, you must change the maximum value first.

The **no** variant of this command sets the **minadvertinterval** back to the default of 450 seconds.

Syntax `ip irdp minadvertinterval <3-1800>`
`no ip irdp minadvertinterval`

Parameter	Description
<3-1800>	The minimum time between advertisements in seconds.

Default The IRDP minimum advertisement interval is set to 450 seconds (7.5 minutes) by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the minimum interval between advertisements on `vlan4` to 900 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan4
awplus(config-if)# ip irdp minadvertinterval 900
```

To set the minimum interval between advertisements on `vlan4` back to the default of 450 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan4
awplus(config-if)# no ip irdp minadvertinterval
```

Related commands

- ip irdp**
- ip irdp lifetime**
- ip irdp maxadvertinterval**
- show ip irdp interface**

ip irdp multicast

Overview This command configures multicast Router Discovery advertisements on an interface. The interface sends IRDP advertisements with the all-system multicast address (224.0.0.1) as the IP destination address.

The **no** variant of this command configures broadcast Router Discovery advertisements on an interface. The interface sends IRDP advertisements with the broadcast address (255.255.255.255) as the IP destination address.

The multicast address is the default IP destination address for Router Discovery advertisements.

Syntax `ip irdp multicast`
`no ip irdp multicast`

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To enable multicast Router Discovery advertisements on `vlan5`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan5
awplus(config-if)# ip irdp multicast
```

To enable broadcast Router Discovery advertisements on `vlan5`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan5
awplus(config-if)# no ip irdp multicast
```

Related commands [ip irdp](#)
[ip irdp broadcast](#)
[show ip irdp interface](#)

ip irdp preference

Overview When multiple routers connected to a LAN are all sending Router Discovery advertisements, hosts need to be able to choose the best router to use. Therefore the IRDP defines a preference value to place in the Router Discovery advertisements. Hosts choose the router with the highest preference value.

This command sets the preference value to include in Router Discovery advertisements sent for the specified interface.

When this command is used, all IP addresses on the interface are assigned the same preference value, except the addresses that have specific preference value assignment using the command **ip irdp address preference**.

The **no** variant of this command sets the preference value to the default of 0.

Syntax `ip irdp preference <0-2147483647>`
`no ip irdp preference`

Parameter	Description
<0-2147483647>	The preference value for the interface. A higher number increases the preference level for addresses on the specific interface.

Default The default preference value is 0.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the preference of addresses advertised on `vlan6` to 500, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan6
awplus(config-if)# ip irdp preference 500
```

To set the preference value for addresses on `vlan6` back to the default of 0, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan6
awplus(config-if)# no ip irdp preference
```

Related commands **ip irdp**
ip irdp address preference
show ip irdp interface

ip limited-local-proxy-arp

Overview Use this command to enable local proxy ARP, but only for a specified set of IP addresses. This makes the device respond to ARP requests for those IP addresses when the addresses are reachable via the interface you are configuring.

To specify the IP addresses, use the command **local-proxy-arp**.

Use the **no** variant of this command to disable limited local proxy ARP. This stops your device from intercepting and responding to ARP requests for the specified hosts. This allows the hosts to use MAC address resolution to communicate directly with one another.

Syntax `ip limited-local-proxy-arp`
`no ip limited-local-proxy-arp`

Default Limited local proxy ARP is disabled by default.

Mode Interface Configuration for VLAN interfaces.

Usage This command allows you to stop MAC address resolution for specified hosts. Limited local proxy ARP works by intercepting ARP requests for the specified hosts and responding with your device's own MAC address details instead of the destination host's details. This stops hosts from learning the MAC address of the other hosts through ARP requests.

Limited local proxy ARP ensures that the specified devices cannot send traffic that bypasses Layer 3 routing on your device. This gives you control over which hosts may communicate with one another.

Example To enable limited local proxy ARP, so that the device makes ARP responses to ARP requests for specified addresses, when the ARP requests are received on VLAN2 and the addresses are routed out VLAN2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip limited-local-proxy-arp
```

Related commands [ip local-proxy-arp](#)
[local-proxy-arp](#)

ip local-proxy-arp

Overview This command allows you to stop MAC address resolution between hosts within a subnet. Local Proxy ARP works by intercepting ARP requests between hosts within a subnet and responding with your device's own MAC address details instead of the destination host's details. This stops hosts from learning the MAC address of other hosts within its subnet through ARP requests.

Local Proxy ARP is used in private VLAN edge (protected port) configurations.

Local Proxy ARP ensures that devices within a subnet cannot send traffic that bypasses Layer 3 routing on your device. This lets you monitor and filter traffic between hosts in the same subnet, and enables you to have control over which hosts may communicate with one another.

When Local Proxy ARP is operating on an interface, your device does not generate or forward any ICMP-Redirect messages on that interface. This command does not enable proxy ARP on the interface; see the [ip proxy-arp](#) command for more information on enabling proxy ARP.

The **no** variant of this command disables Local Proxy ARP to stop your device from intercepting and responding to ARP requests between hosts within a subnet. This allows the hosts to use MAC address resolution to communicate directly with one another. Local Proxy ARP is disabled by default.

Syntax ip local-proxy-arp
no ip local-proxy-arp

Default Local Proxy ARP is disabled by default.

Mode Interface Configuration for VLAN interfaces.

Examples To enable your device to apply Local Proxy ARP on the interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip local-proxy-arp
```

To stop your device from doing Local Proxy ARP on the interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip local-proxy-arp
```


Related commands **ip proxy-arp**
show arp
show running-config

ip proxy-arp

Overview This command enables Proxy ARP responses to ARP requests on an interface. When enabled, your device intercepts ARP broadcast packets and substitutes its own physical address for that of the remote host. By responding to the ARP request, your device ensures that subsequent packets from the local host are directed to its physical address, and it can then forward these to the remote host.

Your device responds only when it has a specific route to the address being requested, excluding the interface route that the ARP request arrived from. It ignores all other ARP requests. See the [ip local-proxy-arp](#) command about enabling your device to respond to other ARP messages.

The **no** variant of this command disables Proxy ARP responses on an interface. Proxy ARP is disabled by default.

Syntax ip proxy-arp
no ip proxy-arp

Default Proxy ARP is disabled by default.

Mode Interface Configuration for VLAN interfaces.

Examples To enable your device to do Proxy ARP on the interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip proxy-arp
```

To stop your device from doing Proxy ARP on the interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip proxy-arp
```

Related commands [arp](#)
[ip local-proxy-arp](#)
[show arp](#)
[show running-config](#)

ip redirects

Overview This command enables the device to send ICMP redirects on one or more interfaces.

Use the **no** variant of this command to stop the device from sending ICMP redirects on one or more interfaces.

Syntax `ip redirects`
`no ip redirects`

Default ICMP redirects are disabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes ICMP redirect messages are used to notify hosts that a better route is available to a destination.

ICMP redirects are used when a packet is routed into the device on the same interface that the packet is routed out of the device. ICMP redirects are only sent to packet sources that are directly connected to the device.

Examples To enable the device to send ICMP redirects on interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip redirects
```

To stop the device from sending ICMP redirects on interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip redirects
```

ip tcp synack-retries

Overview Use this command to specify how many times the switch will retry sending a SYN ACK for a TCP connection for which it has received a SYN but not an ACK. Such connections are called half-open TCP connections. This command allows you to influence how long half-open TCP connections take to time out.

Use the **no** variant of this command to return to the default setting of 5 retries.

Syntax ip tcp synack-retries <0-255>
no ip tcp synack-retries

Parameter	Description
<0-255>	Number of times to retry sending the SYN ACK

Default 5 retries

Mode Global Configuration

Usage notes The following table shows the approximate correlation between the number of retries and the time half-open TCP connections take to time out.

Number of retries	Approximate lower bound for the timeout
0 retries	1 second
1 retry	3 seconds
2 retries	7 seconds
3 retries	15 seconds
4 retries	31 seconds
5 retries	63 seconds

Example To retry twice, which leads to a timeout of approximately 7 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip tcp synack-retries 2
```

Related commands [show running-config](#)

Command changes Version 5.4.7-0.2: command added

ip tcp-timestamp

Overview Use this command to enable TCP timestamp responses.

Use the **no** variant of this command to disable TCP timestamp responses.

You may wish to disable timestamp responses because TCP timestamps may allow other parties to remotely calculate the system uptime and boot time of the device and the device's clock. To prevent this information leaking to potential attackers, we recommend you disable TCP timestamps on the device, unless you need to use them.

Syntax `ip tcp-timestamp`
`no ip tcp-timestamp`

Default Enabled

Mode Global Configuration

Example To disable TCP timestamp responses, use the commands:

```
awplus# configure terminal
awplus(config)# no ip tcp-timestamp
```

To enable TCP timestamp responses again, use the commands:

```
awplus# configure terminal
awplus(config)# ip tcp-timestamp
```

Related commands [ip icmp-timestamp](#)

Command changes Version 5.5.2-0.1: command added

ip unreachable

Overview Use this command to enable ICMP (Internet Control Message Protocol) type 3, destination unreachable, messages.

Use the **no** variant of this command to disable destination unreachable messages. This prevents an attacker from using these messages to discover the topology of a network.

Syntax ip unreachable
no ip unreachable

Default Destination unreachable messages are enabled by default.

Mode Global Configuration

Usage notes When a device receives a packet for a destination that is unreachable it returns an ICMP type 3 message, this message includes a reason code, as per the table below. An attacker can use these messages to obtain information regarding the topology of a network. Disabling destination unreachable messages, using the **no ip unreachable** command, secures your network against this type of probing.

NOTE: *Disabling ICMP destination unreachable messages breaks applications such as traceroute and Path MTU Discovery (PMTUD), which depend on these messages to operate correctly.*

ICMP type 3 reason codes and description

Code	Description [RFC]
0	Network unreachable [RFC792]
1	Host unreachable [RFC792]
2	Protocol unreachable [RFC792]
3	Port unreachable [RFC792]
4	Fragmentation required, and DF flag set [RFC792]
5	Source route failed [RFC792]
6	Destination network unknown [RFC1122]
7	Destination host unknown [RFC1122]
8	Source host isolated [RFC1122]
9	Network administratively prohibited [RFC768]
10	Host administratively prohibited [RFC869]
11	Network unreachable for Type of Service [RFC908]
12	Host unreachable for Type of Service [RFC938]
13	Communication administratively prohibited [RFC905]
14	Host Precedence Violation [RFC1812]
15	Precedence cutoff in effect [RFC1812]

Example To disable destination unreachable messages, use the commands

```
awplus# configure terminal  
awplus(config)# no ip unreachable
```

To enable destination unreachable messages, use the commands

```
awplus# configure terminal  
awplus(config)# ip unreachable
```


local-proxy-arp

Overview Use this command to specify an IP subnet for use with limited local proxy ARP. When limited local proxy ARP is enabled with the command **ip limited-local-proxy-arp**, the device will respond to ARP requests for addresses in that subnet.

Use the **no** variant of this command to stop specifying a subnet for use with limited local proxy ARP.

Syntax local-proxy-arp [<ip-add/mask>]
no local-proxy-arp [<ip-add/mask>]

Parameter	Description
<ip-add/mask>	The IP subnet to use with limited local proxy ARP, in dotted decimal format (A.B.C.D/M). To specify a single IP address, use a 32-bit mask.

Default No subnets are specified for use with limited local proxy ARP.

Mode Global Configuration

Example To specify limited local proxy ARP for the address 172.22.0.3, use the following commands:

```
awplus# configure terminal
awplus(config)# local-proxy-arp 172.22.0.3/32
```

Related commands **ip limited-local-proxy-arp**

optimistic-nd

Overview Use this command to enable the optimistic neighbor discovery feature for both IPv4 and IPv6.

Use the **no** variant of this command to disable the optimistic neighbor discovery feature.

Syntax optimistic-nd
no optimistic-nd

Default The optimistic neighbor discovery feature is enabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes The optimistic neighbor discovery feature allows the device, after learning an IPv4 or IPv6 neighbor, to refresh the neighbor before the neighbor is deleted from the hardware L3 switching table. The device puts the neighbor entry into the 'stale' state in the software switching table if it is not refreshed, then the 'stale' neighbors are deleted from the hardware L3 switching table.

The optimistic neighbor discovery feature enables the device to sustain L3 traffic switching to a neighbor without interruption. Without the optimistic neighbor discovery feature enabled L3 traffic is interrupted when a neighbor is 'stale' and is then deleted from the L3 switching table.

If a neighbor receiving optimistic neighbor solicitations does not answer optimistic neighbor solicitations with neighbor advertisements, then the neighbor will be put into the 'stale' state, and subsequently deleted from both the software and the hardware L3 switching tables.

Examples To enable the optimistic neighbor discovery feature on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# optimistic-nd
```

To disable the optimistic neighbor discovery feature on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no optimistic-nd
```

Related commands [show running-config](#)

ping

Overview This command sends a query to another IPv4 host (send Echo Request messages).

Syntax ping [ip] <host> [broadcast] [df-bit {yes|no}]
[interval <0-128>] [pattern <hex-data-pattern>] [repeat
<1-2147483647>|continuous] [size <36-18024>] [source <ip-
addr>] [timeout <1-65535>] [tos <0-255>]

Parameter	Description
<host>	The destination IP address or hostname.
broadcast	Allow pinging of a broadcast address.
df-bit	Enable or disable the do-not-fragment bit in the IP header.
interval <0-128>	Specify the time interval in seconds between sending ping packets. The default is 1. You can use decimal places to specify fractions of a second. For example, to ping every millisecond, set the interval to 0.001.
pattern <hex-data-pattern>	Specify the hex data pattern.
repeat	Specify the number of ping packets to send.
<1-2147483647>	Specify repeat count. The default is 5.
continuous	Continuous ping
size <36-18024>	The number of data bytes to send, excluding the 8 byte ICMP header. The default is 56 (64 ICMP data bytes).
source <ip-addr>	The IP address of a configured IP interface to use as the source in the IP header of the ping packet.
timeout <1-65535>	The time in seconds to wait for echo replies if the ARP entry is present, before reporting that no reply was received. If no ARP entry is present, it does not wait.
tos <0-255>	The value of the type of service in the IP header.

Mode User Exec and Privileged Exec

Example To ping the IP address 10.10.0.5 use the following command:

```
awplus# ping 10.10.0.5
```

platform multicast-address-mismatch-action

Overview Use this command to change the action taken by the switch when it receives IP multicast packets that have mismatched destination MAC address and destination IP address. Such packets are used by services like Microsoft Network Load Balancing (MS-NLB), in which case they need to be flooded across the switch.

Use the **no** variant of this command to return to the default action.

Syntax platform multicast-address-mismatch-action {bridge|drop}
no platform multicast-address-mismatch-action

Parameter	Description
drop	Drop IP multicast packets with mismatched destination addresses on ingress.
bridge	Flood IP multicast packets with mismatched destination addresses.

Default The default behavior depends on whether **arp-mac-disparity multicast** or **arp-mac-disparity multicast-igmp** has been configured on an interface:

- If one of these has been configured, then the default action is to flood the packets.
- If neither of these has been configured, then the default action is to drop the packets.

Mode Global Configuration

Usage notes You must also turn on L3 multicast, using the **ip multicast-routing** command. Otherwise, L2 flooding will occur, because no L3 processing is being done.

Example To ensure that the switch floods packets it receives that have IP multicast packets with mismatched L2/L3 destination addresses, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast-routing
awplus(config)# platform multicast-address-mismatch-action
bridge
```

To return to the default, where the behavior depends on the **arp-mac-disparity** command setting, use the commands:

```
awplus# configure terminal
awplus(config)# no platform multicast-address-mismatch-action
```

Related commands **arp**
arp-mac-disparity
ip multicast-routing

Command changes Version 5.4.8-2.1: command added

router ip irdp

Overview This command globally enables ICMP Router Discovery (IRDP) advertisements on your device. However, your device does not send or process IRDP messages until at least one interface is configured to use IP and has had IRDP enabled on the interface with the **ip irdp** command.

The **no** variant of this command globally disables IRDP advertisements on the device. All interfaces immediately stop transmitting and processing Router Discovery messages.

Syntax router ip irdp
no router ip irdp

Mode Global Configuration

Examples To enable Router Discovery advertisements on your device, use the following commands:

```
awplus# configure terminal
awplus(config)# router ip irdp
```

To disable Router Discovery advertisements on your device, use the following commands:

```
awplus# configure terminal
awplus(config)# no router ip irdp
```

Related commands **ip irdp**
show ip irdp

show arp

Overview Use this command to display entries in the ARP routing and forwarding table—the ARP cache contains mappings of IP addresses to physical addresses for hosts. To have a dynamic entry in the ARP cache, a host must have used the ARP protocol to access another host.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show arp

Mode User Exec and Privileged Exec

Usage notes Running this command with no additional parameters will display all entries in the ARP routing and forwarding table.

Example To display all ARP entries in the ARP cache, use the following command:
awplus# show arp

Output The following shows typical output.

Example output from the show arp command

awplus#show arp					
IP Address	LL Address	Interface	Port	Type	
192.168.27.10	192.168.4.1	vlan1	port1.0.1	dynamic	
192.168.27.100	0000.daa.fcd24	vlan1	port1.0.2	dynamic	
...					

Parameters in the output of the show arp command

Parameter	Meaning
IP Address	IP address of the network device this entry maps to.
LL Address	Hardware address of the network device.
Interface	Interface over which the network device is accessed.
Port	Physical port that the network device is attached to.
Type	Whether the entry is a static or dynamic entry. Static entries are added using the arp command. Dynamic entries are learned from ARP request/reply message exchanges.

Related commands **arp**
clear arp-cache
show arp security

Command changes Version 5.4.9-0.1: Link layer addresses now shown as the hardware address (MAC Address output parameter has been renamed to LL Address).

show debugging ip packet

Overview Use this command to see what debugging is turned on for IP interfaces. IP interface debugging is set using the **debug ip packet interface** command.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging ip packet

Mode User Exec and Privileged Exec

Example To display the IP interface debugging status when the terminal monitor is off, use the commands:

```
awplus# terminal no monitor
awplus# show debugging ip packet
```

Output The following shows typical output.

Example output from the show debugging ip packet command with terminal monitor off

```
awplus#terminal no monitor
awplus#show debugging ip packet
IP debugging status:
interface all tcp (stopped)
...
```

Example To display the IP interface debugging status when the terminal monitor is on, use the commands:

```
awplus# terminal monitor
awplus# show debugging ip packet
```

Output The following shows typical output.

Example output from the show debugging ip packet command with terminal monitor on

```
awplus#terminal monitor
awplus#show debugging ip packet
IP debugging status:
interface all tcp (running)
...
```

Related [debug ip packet interface](#)
commands [terminal monitor](#)

show ip flooding-nexthops

Overview Use this command to display the static and dynamic ARP entries in the ARP cache that flood packets to multiple ports.

Syntax show ip flooding-nexthops

Mode User Exec and Privileged Exec

Example To display all of the flooding nexthop entries in the ARP cache, use the command:

```
awplus# show ip flooding-nexthops
```

Output The following shows typical output.

Example output from show ip flooding-nexthops

awplus#show ip flooding-nexthops				
IP Address	MAC Address	Interface	Flooding Mode	Type
11.11.11.10	0300.0000.0011	vlan1	port-group	static

Related commands [show arp](#)

Command changes Version 5.4.8-2.1: command added

show ip forwarding

Overview Use this command to display the IP forwarding status.

Syntax show ip forwarding

Mode User Exec and Privileged Exec

Example awplus# show ip forwarding

Output The following shows typical output.

Example output from the show ip forwarding command

```
awplus#show ip forwarding
IP forwarding is on
```

Related commands [ip forwarding](#)

show ip interface

Overview Use this command to display information about interfaces and the IP addresses assigned to them. To display information about a specific interface, specify the interface name with the command.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ip interface [<interface-list>] [brief]

Parameter	Description
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. The specified interfaces must exist.

Mode User Exec and Privileged Exec

Examples To show brief information for the assigned IP address for interface vlan2 use the command:

```
awplus# show ip interface vlan2 brief
```

Output The following shows typical output.

Example output from the show ip interface brief command

Interface	IP-Address	Status	Protocol
port1.0.1	unassigned	admin up	down
...			
vlan1	192.168.1.1	admin up	running
...			

show ip irdp

Overview This command displays whether IRDP is globally enabled on your device, and the status of the debugging modes.

If the **debug ip irdp** command has been set with the **detail** parameter then the **both** parameter is also set and the output will show “packet debugging mode is all”.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip irdp

Mode User Exec and Privileged Exec

Example To display global IRDP configuration, use the command:

```
awplus# show ip irdp
```

Output The following shows typical output.

Example output from the show ip irdp command

```
IRDP is enabled
  event debugging is disabled
  nsm debugging is disabled
  packet debugging mode is disabled
```

Example output from the show ip irdp command with debug ip irdp detail set

```
IRDP is enabled
  event debugging is disabled
  nsm debugging is disabled
  packet debugging mode is all
```

Example output from the show ip irdp command with debug ip irdp both set

```
IRDP is enabled
  event debugging is disabled
  nsm debugging is disabled
  packet debugging mode is both
```

Related commands [debug ip irdp](#)
[router ip irdp](#)

show ip irdp interface

Overview This command displays the configuration of IRDP on all interfaces, or for a specified interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip irdp interface [*<interface-name>*]

Parameter	Description
<i><interface-name></i>	Displays the interface status and configuration details of the specified interface.

Mode User Exec and Privileged Exec

Example To display the IRDP configuration for `vlan4`, use the command:

```
awplus# show ip irdp interface vlan4
```

Output The following shows typical output.

Example output from the show ip irdp interface command

vlan13 is up, line protocol is up			
ICMP Router Discovery Protocol			
Sending mode		multicast	
Router Lifetime		1350 seconds	
Default Preference		0	
Min Adv Interval		450 seconds	
Max Adv Interval		600 seconds	
Next advertisement in 551 seconds			
Non default prefix preferences			
192.168.1.1		preference	25000
In packets		0	Out packets 3
In bad packets		0	Out bad packets 0
In good packets		0	Out good packets 3
In ignored packets		0	

Parameters in the output of the show ip irdp interface command

Parameter	Description
Sending mode	Whether this interface is sending broadcast or multicast router advertisements. This means the destination IP address of router advertisements will be either the multicast address 224.0.0.1, or the broadcast address 255.255.255.255.
Router Lifetime	The lifetime value set for router advertisements sent from this interface. This is the maximum time that other devices should treat the advertised address as valid.
Default Preference	The preference value for IP addresses as default router addresses, relative to other router addresses on the same subnet. This preference value is used for all IP addresses on this interface, except for those listed under the heading "non default prefix preferences".
Min Adv Interval	Minimum time allowed between sending router advertisements from this interface.
Max Adv Interval	Maximum time allowed between sending router advertisements from this interface.
Non default prefix preferences	List of the IP addresses on this interface that have been set with a specific router preference value. These addresses use the preference value listed beside them, rather than the interface's default preference value.
In packets	The total number of packets received by IRDP on this interface. IRDP processes all ICMP packets received on this interface.
Out packets	The number of packets sent by IRDP on this interface.

Parameter	Description
In bad packets	The number of packets received by IRDP that it has discarded because they do not conform or corrupted.
Out bad packets	The number of packets that IRDP generated but failed to send to the network layer.
In good packets	The number of packets received and processed by IRDP.
Out good packets	The number of packets generated and successfully sent by IRDP.
In ignored packets	The number of incoming packets ignored, like ICMP packets other than IRDP.

Related commands [ip irdp](#)
[show ip irdp](#)

show ip sockets

Overview Use this command to display information about the IP or TCP sockets that are present on the device. It includes TCP and UDP listen sockets, and displays the associated IP address and port.

The information displayed for established TCP sessions includes the remote IP address, port, and session state. Raw IP protocol listen socket information is also displayed for protocols such as VRRP and ICMP6, which are configured to receive IP packets with the associated protocol number.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip sockets

Mode Privileged Exec

Usage notes Use this command to verify that the socket being used is opening correctly. If there is a local and remote endpoint, a connection is established with the ports indicated.

Note that this command does not display sockets that are used internally for exchanging data between the various processes that exist on the device and are involved in its operation and management. It only displays sockets that are present for the purposes of communicating with other external devices.

Example To display IP sockets currently present on the device, use the command:
awplus# show ip sockets

Output The following shows typical output.

Example output from show ip sockets

Socket information			
Not showing 40 local connections			
Not showing 7 local listening ports			
Typ	Local Address	Remote Address	State
tcp	0.0.0.0:111	0.0.0.0:*	LISTEN
tcp	0.0.0.0:80	0.0.0.0:*	LISTEN
tcp	0.0.0.0:23	0.0.0.0:*	LISTEN
tcp	0.0.0.0:443	0.0.0.0:*	LISTEN
tcp	0.0.0.0:4743	0.0.0.0:*	LISTEN
tcp	0.0.0.0:873	0.0.0.0:*	LISTEN
tcp	:::23	:::*	LISTEN
udp	0.0.0.0:111	0.0.0.0:*	
udp	226.94.1.1:5405	0.0.0.0:*	
udp	0.0.0.0:161	0.0.0.0:*	
udp	:::161	:::*	
raw	0.0.0.0:112	0.0.0.0:*	112
raw	:::58	:::*	58
raw	:::112	:::*	112

Parameters in the output from show ip sockets

Parameter	Description
Not showing <number> local connections	This field refers to established sessions between processes internal to the device, that are used in its operation and management. These sessions are not displayed as they are not useful to the user. <number> is some positive integer.
Not showing <number> local listening ports	This field refers to listening sockets belonging to processes internal to the device, that are used in its operation and management. They are not available to receive data from other devices. These sessions are not displayed as they are not useful to the user. <number> is some positive integer.
Typ	This column displays the type of the socket. Possible values for this column are: tcp : IP Protocol 6 udp : IP Protocol 17 raw : Indicates that socket is for a non port-orientated protocol (i.e. a protocol other than TCP or UDP) where all packets of a specified IP protocol type are accepted. For raw socket entries the protocol type is indicated in subsequent columns.
Local Address	For TCP and UDP listening sockets this shows the destination IP address (either IPv4 or IPv6) and destination TCP or UDP port number for which the socket will receive packets. The address and port are separated by ':'. If the socket will accept packets addressed to any of the device's IP addresses, the IP address will be 0.0.0.0 for IPv4 or :: for IPv6. For active TCP sessions the IP address will display which of the devices addresses the session was established with. For raw sockets this displays the IP address and IP protocol for which the socket will accept IP packets. The address and protocol are separated by ':'. If the socket will accept packets addressed to any of the device's IP addresses, the IP address will be 0.0.0.0 for IPv4 and :: for IPv6. IP Protocol assignments are described at: www.iana.org/assignments/protocol-numbers
Remote Address	For TCP and UDP listening sockets this shows the source IP address (either IPv4 or IPv6) and source TCP or UDP port number for which the socket will accept packets. The address and port are separated by ':'. If the socket will accept packets addressed from any IP address, the IP address will be 0.0.0.0 for IPv4 or :: for IPv6. This is the usual case for a listening socket. Normally for a listen socket any source port will be accepted. This is indicated by '. For active TCP sessions the IP address will display the remote address and port the session was established with. For raw sockets the entry in this column will be 0.0.0.0: or ::: for IPv4 and IPv6, respectively.

Parameter	Description
State	This column shows the state of the socket. For TCP sockets this shows the state of the TCP state machine. For UDP sockets this column is blank. For raw sockets it contains the IP protocol number. The possible TCP states are: LISTEN SYN-SENT SYN-RECEIVED ESTABLISHED FIN-WAIT-1 FIN-WAIT-2 CLOSE-WAIT CLOSING LAST-ACK TIME-WAIT CLOSED RFC793 contains the TCP state machine diagram with Section 3.2 describing each of the states.

show ip traffic

Overview Use this command to display statistics regarding IP traffic sent and received by all interfaces on the device, showing totals for IP and IPv6 and then broken down into sub-categories such as TCP, UDP, ICMP and their IPv6 equivalents when appropriate.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip traffic

Mode Privileged Exec

Example To display IP traffic statistics, use the command:

```
awplus# show ip traffic
```

Output The following shows typical output.

Example output from the show ip traffic command

```
awplus#show ip traffic
IP:
  168475 packets received
  168475 delivered
  208099 sent
  35 dropped due to missing route
  22646409 bytes received
  126783216 bytes sent
  InCsumErrors 0
  InNoECTPkts 168475
  InECT1Pkts 0
  InECT0Pkts 0
  InCEPkts 0
  In107 Destination Unreachable
  Out11 Destination Unreachable
IPv6:
  14 packets received
  14 received packets delivered
  18 packets transmitted
...
ICMP6:
  4 messages sent
...
UDP6:
  Udp6RcvbufErrors 0
...
UDPLite6:
  UdpLite6RcvbufErrors 0
...

TCP:
  8 remote connections established
...
UDP:
  79797 datagrams received
...
UDPLite:
  InCsumErrors 0
...
```

tcpdump

Overview Use this command to start a tcpdump, which gives the same output as the Unix-like **tcpdump** command to display TCP/IP traffic. Press <ctrl> + c to stop a running tcpdump.

Syntax tcpdump <line>

Parameter	Description
<line>	Specify the dump options. For more information on the options for this placeholder see http://www.tcpdump.org/tcpdump_man.html

Mode Privileged Exec

Example To start a tcpdump running to capture IP packets, enter the command:

```
awplus# tcpdump ip
```

Output

```
03:40:33.221337 IP 192.168.1.1 > 224.0.0.13: PIMv2, Hello,
length: 34
1 packets captured
2 packets received by filter
0 packets dropped by kernel
```

Related commands [debug ip packet interface](#)

traceroute

Overview Use this command to trace the route to the specified IPv4 host.

Syntax `traceroute {<ip-addr>|<hostname>}`

Parameter	Description
<code><ip-addr></code>	The destination IPv4 address. The IPv4 address uses the format A.B.C.D.
<code><hostname></code>	The destination hostname.

Mode User Exec and Privileged Exec

Example `awplus# traceroute 10.10.0.5`

undebug ip packet interface

Overview This command applies the functionality of the no **debug ip packet interface**.

undebug ip irdp

Overview This command applies the functionality of the no **debug ip irdp**.

21

Domain Name Service (DNS) Commands

- Contents**
- **Introduction** on page 961
 - **clear ip dns forwarding cache** on page 962
 - **debug ip dns forwarding** on page 963
 - **ip dns forwarding** on page 964
 - **ip dns forwarding cache** on page 966
 - **ip dns forwarding dead-time** on page 968
 - **ip dns forwarding domain-list** on page 970
 - **ip dns forwarding retry** on page 971
 - **ip dns forwarding source-interface** on page 972
 - **ip dns forwarding timeout** on page 973
 - **ip domain-list** on page 974
 - **ip domain-lookup** on page 975
 - **ip domain-name** on page 977
 - **ip name-server** on page 978
 - **ip name-server preferred-order** on page 980
 - **show debugging ip dns forwarding** on page 981
 - **show hosts** on page 982
 - **show ip dns forwarding** on page 984
 - **show ip dns forwarding cache** on page 985
 - **show ip dns forwarding server** on page 986
 - **show ip domain-list** on page 987
 - **show ip domain-name** on page 988
 - **show ip name-server** on page 989

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Domain Name Service (DNS) features, including the following:

- DNS client
- DNS forwarding (DNS relay)

For more information about DNS for Switches, see the **Domain Name System (DNS) for AlliedWare Plus Switches Feature Overview and Configuration Guide**.

clear ip dns forwarding cache

Overview Use this command to clear the DNS Relay name resolver cache.

Syntax clear ip dns forwarding cache

Mode Privileged Exec

Examples To clear all cached data, use the command:

```
awplus# clear ip dns forwarding cache
```

Related commands [ip dns forwarding cache](#)

debug ip dns forwarding

Overview Use this command to enable DNS Relay debugging.
Use the **no** variant of this command to disable DNS Relay debugging.

Syntax debug ip dns forwarding
no debug ip dns forwarding

Default DNS Relay debugging is disabled by default.

Mode Privileged Exec

Examples To enable DNS forwarding debugging, use the commands:
awplus# debug ip dns forwarding
To disable DNS forwarding debugging, use the commands:
awplus# no debug ip dns forwarding

Related commands [ip dns forwarding](#)
[show debugging ip dns forwarding](#)

ip dns forwarding

Overview Use this command to enable DNS Relay, the forwarding of incoming DNS queries for IP hostname-to-address translation.

Use the **no** variant of this command to disable the forwarding of incoming DNS queries for IP hostname-to-address translation.

Syntax ip dns forwarding
no ip dns forwarding

Default The forwarding of incoming DNS query packets is disabled by default.

Mode Global Configuration

Usage notes DNS Relay is independent of the configuration of **ip domain-lookup** (which is enabled by default). If **ip domain-lookup** is disabled, but DNS Relay is enabled, the router will continue to forward DNS queries by hosts in the network to its configured name-servers.

See the **ip dns forwarding dead-time** command used with this command.

Examples To enable the forwarding of incoming DNS query packets, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding
```

To disable the forwarding of incoming DNS query packets, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding
```


Related commands

- clear ip dns forwarding cache**
- debug ip dns forwarding**
- ip dns forwarding cache**
- ip dns forwarding dead-time**
- ip dns forwarding retry**
- ip dns forwarding source-interface**
- ip dns forwarding timeout**
- ip domain-lookup**
- ip name-server**
- show ip dns forwarding**
- show ip dns forwarding cache**
- show ip dns forwarding server**

ip dns forwarding cache

Overview Use this command to set the DNS Relay name resolver cache size and cache entry lifetime period. The DNS Relay name resolver cache stores the mappings between domain names and IP addresses.

Use the **no** variant of this command to set the default DNS Relay name resolver cache size and cache entry lifetime period.

Note that the lifetime period of the cache entry can be overwritten by the time-out period of the DNS reply from the DNS server if the time-out period of the DNS reply from the DNS server is smaller than the configured time-out period. The time-out period of the cache entry will only be used when the time-out period of the DNS reply from the DNS server is bigger than the time-out period configured on the device.

Syntax `ip dns forwarding cache [size <0-10000>] [timeout <60-3600>]`
`no ip dns forwarding cache [size|timeout]`

Parameter	Description
<0-10000>	Number of entries in the DNS Relay name resolver cache.
<60-3600>	Timeout value in seconds.

Default The default cache size is 0 (no entries) and the default lifetime is 1800 seconds.

Mode Global Configuration

Examples To set the cache size to 10 entries and the lifetime to 500 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding cache size 10 time 500
```

To set the cache size to the default, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding cache size
```

Related commands

- [clear ip dns forwarding cache](#)
- [debug ip dns forwarding](#)
- [ip dns forwarding](#)
- [show ip dns forwarding](#)
- [show ip dns forwarding cache](#)

Command changes Version 5.4.8-1.1: maximum cache limit increased to 10000

ip dns forwarding dead-time

Overview Use this command to set the time period in seconds when the device stops sending any DNS requests to an unresponsive server and all retries set using **ip dns forwarding retry** are used. This time period is the DNS forwarding dead-time. The device stops sending DNS requests at the DNS forwarding dead-time configured and when all of the retries are used.

Use the **no** variant of this command to restore the default DNS forwarding dead-time value of 3600 seconds.

Syntax `ip dns forwarding dead-time <60-43200>`
`no ip dns forwarding retry`

Parameter	Description
<60-43200>	Set the DNS forwarding dead-time in seconds. At the dead-time set, the switch stops sending DNS requests to an unresponsive server.

Default The default time to stop sending DNS requests to an unresponsive server is 3600 seconds.

Mode Global Configuration

Usage notes See the **ip dns forwarding retry** command used with this command.

Examples To set the DNS forwarding retry count to 50 and to set the DNS forwarding dead-time to 1800 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding dead-time 1800
awplus(config)# ip dns forwarding retry 50
```

To reset the DNS retry count to the default of 2 and the DNS forwarding dead-time to the default of 3600, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding dead-time
awplus(config)# no ip dns forwarding retry
```

Related commands

- [debug ip dns forwarding](#)
- [ip dns forwarding](#)
- [ip dns forwarding retry](#)
- [show ip dns forwarding](#)
- [show ip dns forwarding server](#)

ip dns forwarding domain-list

Overview Use this command to create a domain-list that can be used as a suffix-list for DNS lookups. This command puts the device into a new mode where subsequent commands can be entered. The new mode is "Domain List Configuration" mode.

Use the **no** variant of this command to delete the domain-list.

Syntax `ip dns forwarding domain-list <domain-list-name>`
`no ip dns forwarding domain-list <domain-list-name>`

Parameter	Description
<code><domain-list-name></code>	Name of the list.

Mode Global Configuration

Usage notes The domain list can be used by features that need to match against domains. A domain list by itself does nothing; it must be attached to another feature to have functionality (like a prefix-list). For example, the domain list can be used as a suffix list on an DNS name-server. The DNS server can be either statically configured, or learned over a PPP connection.

Note that this command is separate from the **ip domain-list** command, which is used by DNS client to append a domain on to the end of a partial hostname to form a fully-qualified domain.

Examples To create a domain list to include domains that are internal to the company such as "engineering.acme" or "intranet.acme", use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding domain-list corporatedomains
awplus(config-domain-list)# description internal network domain
awplus(config-domain-list)# domain engineering.acme
awplus(config-domain-list)# domain intranet.acme
```

To delete the domain list, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding domain-list
corporatedomains
```

Related commands [ip name-server](#)

ip dns forwarding retry

Overview Use this command to set the number of times DNS Relay will retry to forward DNS queries. The device stops sending DNS requests to an unresponsive server at the time set using the **ip dns forwarding dead-time** command and when all of the retries are used.

Use the **no** variant of this command to set the number of retries to the default of 2.

Syntax `ip dns forwarding retry <0-100>`
`no ip dns forwarding retry`

Parameter	Description
<0-100>	Set the number of times DNS Relay will retry to forward a DNS query.

Default The default number of retries is 2 DNS requests to an unresponsive server.

Mode Global Configuration

Usage notes See the **ip dns forwarding dead-time** command used with this command.

Examples To set the DNS forwarding retry count to 50 and to set the DNS forwarding dead-time to 1800 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding retry 50
awplus(config)# ip dns forwarding dead-time 1800
```

To reset the DNS retry count to the default of 2 and the DNS forwarding dead-time to the default of 3600 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding retry
awplus(config)# no ip dns forwarding dead-time
```

Related commands **debug ip dns forwarding**
ip dns forwarding
ip dns forwarding dead-time
show ip dns forwarding

ip dns forwarding source-interface

Overview Use this command to set the interface to use for forwarding and receiving DNS queries.

Use the **no** variant of this command to unset the interface used for forwarding and receiving DNS queries.

Syntax ip dns forwarding source-interface <interface-name>
no ip dns forwarding source-interface

Parameter	Description
<interface-name>	An alphanumeric string that is the interface name.

Default The default is that no interface is set and the device selects the appropriate source IP address automatically.

Mode Global Configuration

Examples To set vlan1 as the source interface for relayed DNS queries, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding source-interface vlan1
```

To clear the source interface for relayed DNS queries, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding source-interface
```

Related commands [debug ip dns forwarding](#)
[ip dns forwarding](#)
[show ip dns forwarding](#)

ip dns forwarding timeout

Overview Use this command to set the time period for the DNS Relay to wait for a DNS response.

Use the **no** variant of this command to set the time period to wait for a DNS response to the default of 3 seconds.

Syntax `ip dns forwarding timeout <0-3600>`
`no ip dns forwarding timeout`

Parameter	Description
<code><0-3600></code>	Timeout value in seconds.

Default The default timeout value is 3 seconds.

Mode Global Configuration

Examples To set the timeout value to 12 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dns forwarding timeout 12
```

To set the timeout value to the default of 3 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dns forwarding timeout
```

Related commands [debug ip dns forwarding](#)
[ip dns forwarding](#)
[show ip dns forwarding](#)

ip domain-list

Overview This command adds a domain to the DNS list. Domains are appended to incomplete host names in DNS requests. Each domain in this list is tried in turn in DNS lookups. This list is ordered so that the first entry you create is checked first.

The **no** variant of this command deletes a domain from the list.

Syntax `ip domain-list <domain-name>`
`no ip domain-list <domain-name>`

Parameter	Description
<code><domain-name></code>	Domain string, for example "company.com".

Mode Global Configuration

Usage notes If there are no domains in the DNS list, then your device uses the domain specified with the **ip domain-name** command. If any domain exists in the DNS list, then the device does not use the domain set using the **ip domain-name** command.

Example To add the domain `example.net` to the DNS list, use the following commands:

```
awplus# configure terminal
awplus(config)# ip domain-list example.net
```

Related commands **ip domain-lookup**
ip domain-name
show ip domain-list

ip domain-lookup

Overview This command enables the DNS client on your device. This allows you to use domain names instead of IP addresses in commands. The DNS client resolves the domain name into an IP address by sending a DNS inquiry to a DNS server, specified with the **ip name-server** command.

You can use the **via-relay** parameter to configure the DNS client to use the DNS relay for resolving domain lookups originating from the device. This setup is often preferred because the DNS relay offers additional features not available in the DNS client, such as caching, configurable timeout settings, and more.

The **no** variant of this command disables the DNS client. The client will not attempt to resolve domain names. You must use IP addresses to specify hosts in commands.

Syntax `ip domain-lookup [via-relay]`
`no ip domain-lookup`

Parameter	Description
<code>via-relay</code>	Perform resolution via DNS relay

Mode Global Configuration

Usage notes The client is enabled by default. However, it does not attempt DNS inquiries unless there is a DNS server configured.

Examples To enable the DNS client on your device, use the following commands:

```
awplus# configure terminal
awplus(config)# ip domain-lookup
```

To configure the DNS client to perform resolution via the DNS relay, use the following commands:

```
awplus# configure terminal
awplus(config)# ip domain-lookup via-relay
awplus(config)# ip dns forwarding
```

To disable the DNS client on your device, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip domain-lookup
```

Related commands **ip domain-list**
ip domain-name
ip name-server
show hosts
show ip name-server
ip dns forwarding

Command changes Version 5.4.8-1.1: via-relay parameter added

ip domain-name

Overview This command sets a default domain for the DNS. The DNS client appends this domain to incomplete host-names in DNS requests.

The **no** variant of this command removes the domain-name previously set by this command.

Syntax `ip domain-name <domain-name>`
`no ip domain-name <domain-name>`

Parameter	Description
<code><domain-name></code>	Domain string, for example "company.com".

Mode Global Configuration

Usage notes If there are no domains in the DNS list (created using the **ip domain-list** command) then your device uses the domain specified with this command. If any domain exists in the DNS list, then the device does not use the domain configured with this command.

When your device is using its DHCP client for an interface, it can receive Option 15 from the DHCP server. This option replaces the domain name set with this command.

Example To configure the domain name, enter the following commands:

```
awplus# configure terminal
awplus(config)# ip domain-name company.com
```

Related commands **ip domain-list**
show ip domain-list
show ip domain-name

ip name-server

Overview Use this command to add IPv4 or IPv6 DNS server addresses. The DNS client on your device sends DNS queries to IP addresses in this list when trying to resolve a host name. Host names cannot be resolved until you have added at least one server to this list. A maximum of three name servers can be added to this list.

The **no** variant of this command removes the specified DNS name-server address.

Syntax `ip name-server <ip-addr>`
`no ip name-server <ip-addr>`

Parameter	Description
<code><ip-addr></code>	The IP address of the DNS server that is being added to the name server list. The address is entered in the form A.B.C.D for an IPv4 address, or in the form X:X::X:X for an IPv6 address. The order that you enter the servers in, is the order in which they will be used.

Mode Global Configuration

Usage notes To allow the device to operate as a DNS proxy, your device must have learned about a DNS name-server to forward requests to. Name-servers can be learned through the following means:

- Manual configuration, using the **ip name-server** command
- Learned from DHCP server with Option 6

Use this command to statically configure a DNS name-server for the device to use.

The order that you enter the servers in, is the order in which they will be used.

Examples To allow a device to send DNS queries to a DNS server with the IPv4 address 10.10.10.5, use the commands:

```
awplus# configure terminal
awplus(config)# ip name-server 10.10.10.5
```

To enable your device to send DNS queries to a DNS server with the IPv6 address 2001:0db8:010d::1, use the commands:

```
awplus# configure terminal
awplus(config)# ip name-server 2001:0db8:010d::1
```

Related commands

- ip dns forwarding**
- ip dns forwarding domain-list**
- ip domain-list**
- ip domain-lookup**
- ip domain-name**
- show ip dns forwarding cache**
- show ip name-server**

Command changes Version 5.4.6-2.1: VRF-lite support added to AR-series devices.

ip name-server preferred-order

Overview Use this command to choose between using statically-configured DNS servers or dynamically-learned DNS servers.

Use the **no** variant of this command to set the DNS servers back to the default setting of dynamic.

Syntax ip name-server preferred-order {dynamic|static}
no ip name-server preferred-order

Parameter	Description
dynamic	Use dynamically learned DNS servers first.
static	Use statically configured DNS servers first.

Default dynamic

Mode Global Configuration

Usage notes This command is used to choose which DNS server set to use first. Select either the **dynamic** or **static** parameter.

Examples To configure the preference to use static servers first, use the commands:

```
awplus# configure terminal
awplus(config)# ip name-server preferred-order static
```

To configure the preference to use dynamically-learned servers first, use the commands:

```
awplus# configure terminal
awplus(config)# ip name-server preferred-order dynamic
```

or

```
awplus# configure terminal
awplus(config)# no ip name-server preferred-order
```

Related commands [ip address dhcp](#)
[ip name-server](#)
[ipv6 address dhcp](#)
[show ip name-server](#)

Command changes Version 5.4.9-0.1: command added

show debugging ip dns forwarding

Overview Use this command to see what debugging is turned on for DNS Relay. DNS Relay debugging is set using the **debug ip dns forwarding** command.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging ip dns forwarding

Mode User Exec and Privileged Exec

Example To display the DNS Relay debugging status, use the command:

```
awplus# show debugging ip dns forwarding
```

Output The following shows typical output.

Example output from the show debugging ip dns forwarding command:

```
awplus#show debugging ip dns forwarding
DNS Relay debugging status:
  debugging is on
```

Related commands [debug ip dns forwarding](#)

show hosts

Overview This command shows the default domain, domain list, and name servers configured on your device.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show hosts

Mode User Exec and Privileged Exec

Example To display the default domain, use the command:

```
awplus# show hosts
```

Output The following shows typical output.

Example output from the show hosts command when no ip domain-lookup is configured

```
awplus#show hosts

Default domain is not set
Name/address lookup is disabled
```

Example output from the show hosts command when ip domain-lookup is configured

```
awplus#show hosts

Default domain is mycompany.com
Domain list: company.com
Name/address lookup uses domain service
Name servers are 10.10.0.2 10.10.0.88
```

Example output from the show hosts command when ip domain-lookup via-relay is configured

```
awplus#show hosts

Default domain is mycompany.com
Domain list: company.com
Name/address lookup uses domain relay service
Name servers are 10.10.0.2 10.10.0.88
```

Related **ip domain-list**
commands **ip domain-lookup**
ip domain-name
ip name-server

show ip dns forwarding

Overview Use this command to display the DNS Relay status.

Syntax show ip dns forwarding

Mode User Exec and Privileged Exec

Examples To display the DNS Relay status, use the command:

```
awplus# show ip dns forwarding
```

Output The following shows typical output.

Example output from the show ip dns forwarding command

```
awplus#show ip dns forwarding
Max-Retry      : 2
Timeout        : 3 second(s)
Dead-Time      : 3600 second(s)
Source-Interface: not specified
DNS Cache      : disabled
```

Related commands [ip dns forwarding](#)

show ip dns forwarding cache

Overview Use this command to display the DNS Relay name resolver cache.

Syntax show ip dns forwarding cache

Mode User Exec and Privileged Exec

Example To display the DNS Relay name resolver cache, use the command:

```
awplus# show ip dns forwarding cache
```

Output The following shows typical output.

Example output from the show ip dns forwarding cache command

```
awplus#show ip dns forwarding cache
IPv4 addresses in cache:    3
IPv6 addresses in cache:    0
Cache size: 1000
Host                        Address                Expires  Flags
www.example.com            172.16.1.1.           180
mail.example.com           www.example.com        180 CNAME
www.example.com            172.16.1.1.           180 REVERSE
mail.example.com           172.16.1.5.           180
```

Related commands [ip dns forwarding cache](#)
[ip name-server](#)

Command changes Version 5.4.6-2.1: VRF-lite support added.
Version 5.4.8-1.1: additional cache counters added to output.

show ip dns forwarding server

Overview Use this command to display the status of DNS forwarding name servers.

Syntax show ip dns forwarding server

Parameter	Description
forwarding server	Display information about the DNS forwarding name servers.

Mode User Exec and Privileged Exec

Examples To display the status of DNS Relay name servers, use the command:

```
awplus# show ip dns forwarding server
```

Output The following shows typical output.

Example output from the show ip dns forwarding server command

awplus#show ip dns forwarding server			
Servers	Forwards	Fails	Dead-Time
172.16.1.1	12	0	active
172.16.1.2	6	3	3900

Related commands [ip dns forwarding](#)
[ip dns forwarding dead-time](#)

show ip domain-list

Overview This command shows the domains configured in the domain list. The DNS client uses the domains in this list to append incomplete hostnames when sending a DNS inquiry to a DNS server.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip domain-list

Mode User Exec and Privileged Exec

Example To display the list of domains in the domain list, use the command:

```
awplus# show ip domain-list
```

Output The following shows typical output.

Example output from the show ip domain-list command

```
awplus#show ip domain-list
alliedtelesis.com
mycompany.com
```

Related commands [ip domain-list](#)
[ip domain-lookup](#)

show ip domain-name

Overview This command shows the default domain configured on your device. When there are no entries in the DNS list, the DNS client appends this domain to incomplete hostnames when sending a DNS inquiry to a DNS server.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip domain-name

Mode User Exec and Privileged Exec

Example To display the default domain configured on your device, use the command:

```
awplus# show ip domain-name
```

Output The following shows typical output.

Example output from the show ip domain-name command

```
awplus#show ip domain-name  
alliedtelesis.com
```

Related commands [ip domain-name](#)
[ip domain-lookup](#)

show ip name-server

Overview This command displays a list of IPv4 and IPv6 DNS server addresses that your device will send DNS requests to. This is a static list configured using the **ip name-server** command.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ip name-server

Mode User Exec and Privileged Exec

Example To display the list of DNS servers that your device sends DNS requests to, use the command:

```
awplus# show ip name-server
```

Output The following shows typical output.

Example output from the show ip name-server command

```
awplus# show ip name-server
10.10.0.123
10.10.0.124
2001:0db8:010d::1
```

Related commands **ip domain-lookup**
ip name-server

22

IPv6 Commands

- Contents**
- **Introduction** on page 992
 - **clear ipv6 neighbors** on page 993
 - **ipv6 address** on page 994
 - **ipv6 address autoconfig** on page 996
 - **ipv6 address suffix** on page 998
 - **ipv6 enable** on page 999
 - **ipv6 eui64-linklocal** on page 1001
 - **ipv6 forwarding** on page 1002
 - **ipv6 icmp error-interval** on page 1004
 - **ipv6 multicast forward-slow-path-packet** on page 1005
 - **ipv6 nd accept-ra-default-routes** on page 1006
 - **ipv6 nd accept-ra-pinfo** on page 1007
 - **ipv6 nd current-hoplimit** on page 1008
 - **ipv6 nd dns search-list** on page 1009
 - **ipv6 nd dns-server** on page 1010
 - **ipv6 nd managed-config-flag** on page 1012
 - **ipv6 nd minimum-ra-interval** on page 1013
 - **ipv6 nd other-config-flag** on page 1014
 - **ipv6 nd prefix** on page 1015
 - **ipv6 nd ra-interval** on page 1018
 - **ipv6 nd ra-lifetime** on page 1019
 - **ipv6 nd rguard** on page 1020
 - **ipv6 nd reachable-time** on page 1022
 - **ipv6 nd retransmission-time** on page 1023
 - **ipv6 nd route-information** on page 1024
 - **ipv6 nd router-preference** on page 1026
 - **ipv6 nd suppress-ra** on page 1027
 - **ipv6 neighbor** on page 1028
 - **ipv6 opportunistic-nd** on page 1029
 - **ipv6 route** on page 1030
 - **ipv6 unreachable** on page 1032
 - **optimistic-nd** on page 1034
 - **ping ipv6** on page 1035
 - **show ipv6 forwarding** on page 1037
 - **show ipv6 interface** on page 1038
 - **show ipv6 neighbors** on page 1039
 - **show ipv6 route** on page 1040

- [show ipv6 route summary](#) on page 1042
- [traceroute ipv6](#) on page 1043

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure IPv6. For more information, see the [IPv6 Feature Overview and Configuration Guide](#).

clear ipv6 neighbors

Overview Use this command to clear all dynamic IPv6 neighbor entries.

Syntax `clear ipv6 neighbors`

Mode Privileged Exec

Example `awplus# clear ipv6 neighbors`

Related commands [ipv6 neighbor](#)
[show ipv6 neighbors](#)

ipv6 address

Overview Use this command to set the IPv6 address of an interface. The command also enables IPv6 on the interface, which creates an EUI-64 link-local address as well as enabling RA processing and SLAAC.

To stop the device from processing prefix information (routes and addresses from the received Router Advertisements) use the command **no ipv6 nd accept-ra-pinfo**.

To remove the EUI-64 link-local address, use the command **no ipv6 eui64-linklocal**.

Use the **no** variant of this command to remove the IPv6 address assigned and disable IPv6. Note that if no global addresses are left after removing the IPv6 address then IPv6 is disabled.

Syntax `ipv6 address <ipv6-addr/prefix-length>`
`no ipv6 address <ipv6-addr/prefix-length>`

Parameter	Description
<code><ipv6-addr/prefix-length></code>	Specifies the IPv6 address to be set. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64. Note that your switch will not accept prefix lengths greater than 64.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes Note that the device keeps link-local addresses until you remove them with the **no** variant of the command that established them. See the **ipv6 enable** command for more information.

Also note that the device keeps the link-local address if the global address is removed using a command other than the command that was used to establish the link-local address. For example, if a link local address is established with the **ipv6 enable** command then it will not be removed using a **no ipv6 address** command.

Examples To assign the IPv6 address 2001:0db8::a2/64 to the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 address 2001:0db8::a2/64
```

To remove the IPv6 address 2001:0db8::a2/64 from the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 address 2001:0db8::a2/64
```

Related commands **ipv6 address autoconfig**
ipv6 address dhcp

ipv6 dhcp server

ipv6 enable

ipv6 eui64-linklocal

show running-config

show ipv6 interface

show ipv6 route

ipv6 address autoconfig

Overview Use this command to enable IPv6 stateless address autoconfiguration (SLAAC) for an interface. This configures an IPv6 address on an interface derived from the MAC address on the interface.

Use the **no** variant of this command to disable IPv6 SLAAC on an interface. Note that if no global addresses are left after removing all IPv6 autoconfigured addresses then IPv6 is disabled.

Syntax `ipv6 address autoconfig`
`no ipv6 address autoconfig`

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes Use this command to enable automatic configuration of IPv6 addresses using stateless autoconfiguration on an interface, and enable IPv6.

IPv6 hosts can configure themselves when connected to an IPv6 network using ICMPv6 (Internet Control Message Protocol version 6) router discovery messages. Configured routers respond with a Router Advertisement (RA) containing configuration parameters for IPv6 hosts.

The SLAAC process derives the interface identifier of the IPv6 address from the MAC address of the interface.

When applying SLAAC to an interface, note that the MAC address of the default VLAN is applied to the interface if the interface does not have its own MAC address.

If SLAAC is not suitable then a network can use stateful configuration with DHCPv6 (Dynamic Host Configuration Protocol version 6) Relay, or hosts can be configured statically. See [ip dhcp-relay server-address](#) for the DHCPv6 Relay server command description and examples. See the [IP Feature Overview and Configuration Guide](#) for more information about DNS Relay.

Note that the device keeps link-local addresses until you remove them with the **no** variant of the command that established them. See the [ipv6 enable](#) command for more information.

Also note that the device keeps the link-local address if the global address is removed using a command other than the command that was used to establish the link-local address. For example, if a link local address is established with the [ipv6 enable](#) command then it will not be removed using a `no ipv6 address` command.

Examples To enable SLAAC on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 address autoconfig
```

To disable SLAAC on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 address autoconfig
```

Related commands

- ipv6 address**
- ipv6 enable**
- show ipv6 interface**
- show running-config**

ipv6 address suffix

Overview Use this command to configure the suffix to use when generating an address from prefix information. Any addresses that were created with the EUI-64 suffix will be removed, and new addresses will be added after the next Router Advertisement.

Use the **no** variant of this command to set it back to the default of disabled or set to :: for the same result as the **no** variant.

Syntax `ipv6 address suffix <ipv6-addr-suffix>`
`no ipv6 address suffix`

Parameter	Description
<code><ipv6-addr-suffix></code>	In the format of ::X:X:X:X, for example ::a2d8:0fd8

Default Disabled

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To configure the suffix to use when generating an address from prefix information on vlan2, use the command:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 address suffix ::a2d8:0fd8
```

Related commands [ipv6 nd accept-ra-pinfo](#)
[show running-config interface](#)

Command changes Version 5.4.8-2.1: command added

ipv6 enable

Overview Use this command to enable automatic configuration of a link-local IPv6 address on an interface using Stateless Automatic Address Configuration (SLAAC). By default, the EUI-64 method is used to generate the link-local address.

Use the **no** variant of this command to disable IPv6 on an interface without a global address. Note, to stop EUI-64 from generating the automatic link-local address, use the command **no ipv6 eui64-linklocal**.

Syntax `ipv6 enable`
`no ipv6 enable`

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes The **ipv6 enable** command automatically configures an IPv6 link-local address on the interface and enables the interface for IPv6 processing.

A link-local address is an IP (Internet Protocol) address that is only used for communications in the local network, or for a point-to-point connection. Routing does not forward packets with link-local addresses. IPv6 requires that a link-local address is assigned to each interface that has the IPv6 protocol enabled, and when addresses are assigned to interfaces for routing IPv6 packets.

Note that the device keeps link-local addresses until you remove them with the **no** variant of the command that established them.

Also note that the device keeps the link-local address if the global address is removed using a command other than the command that was used to establish the link-local address. For example, if a link local address is established with the **ipv6 enable** command then it will not be removed using a **no ipv6 address** command.

Default All interfaces default to IPv6-down with no address.

Examples To enable IPv6 with only a link-local IPv6 address on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
```

To disable IPv6 with only a link-local IPv6 address on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 enable
```

Related commands

- ipv6 address**
- ipv6 address autoconfig**
- ipv6 address dhcp**
- ipv6 address (DHCPv6 PD)**
- ipv6 dhcp client pd**
- ipv6 nd prefix**
- show ipv6 interface**
- show ipv6 route**
- show running-config**

ipv6 eui64-linklocal

Overview When IPv6 is enabled on an interface, an EUI link-local address is generated and installed on the interface. In other words, **ipv6 eui64-linklocal** is enabled by default on any IPv6 enabled interface.

Use the **no** variant of this command to disallow the automatic generation of the EUI-64 link-local address on an IPv6 enabled interface.

Syntax `ipv6 eui64-linklocal`
`no ipv6 eui64-linklocal`

Default The command **ipv6 eui64-linklocal** is enabled by default on any IPv6 enabled interface.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To enable IPv6 on the interface vlan1, and use the link-local address of fe80::1/10 instead of the EUI-64 link-local that is automatically generated, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ipv6 enable
awplus(config-if)# no ipv6 eui64-linklocal
awplus(config-if)# ipv6 address fe80::1/10
```

Related commands [ipv6 address](#)
[ipv6 address autoconfig](#)
[ipv6 enable](#)

Command changes Version 5.4.7-0.1: command added

ipv6 forwarding

Overview Use this command to turn on IPv6 unicast routing for IPv6 packet forwarding.

Use this command globally on your device before using the **ipv6 enable** command on individual interfaces.

Use the **no** variant of this command to turn off IPv6 unicast routing. Note IPv6 unicast routing is disabled by default.

NOTE:

Use this command to enable IPv6 unicast routing before configuring either RIPng or OSPFv3 IPv6 routing protocols and static or multicast IPv6 routing.

*Before using PIM-SMv6 commands, IPv6 must be enabled on an interface with the **ipv6 enable** command, IPv6 forwarding must be enabled globally for routing IPv6 with the **ipv6 forwarding** command, and IPv6 multicasting must be enabled globally with the **ipv6 multicast-routing** command.*

Syntax `ipv6 forwarding`
`no ipv6 forwarding`

Mode Global Configuration

Default IPv6 unicast forwarding is disabled by default.

Usage notes Enable IPv6 unicast forwarding globally for all interfaces on your device with this command. Use the **no** variant of this command to disable IPv6 unicast forwarding globally for all interfaces on your device.

IPv6 unicast forwarding allows devices to communicate with devices that are more than one hop away, providing that there is a route to the destination address. If IPv6 forwarding is not enabled then pings to addresses on devices that are more than one hop away will fail, even if there is a route to the destination address.

Examples To enable IPv6 unicast routing, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
```

To disable IPv6 unicast routing, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 forwarding
```

Related **ipv6 enable**
commands **ipv6 multicast-routing**

ipv6 icmp error-interval

Overview Use this command to limit how often IPv6 ICMP error messages are sent. The maximum frequency of messages is specified in milliseconds. Use the **no** variant of this command to reset the frequency to the default

Syntax `ipv6 icmp error-interval <interval>`
`no ipv6 icmp error-interval`

Parameter	Description
<interval>	0-2147483647, interval in milliseconds.

Default 1000

Mode Global Configuration

Example To configure the rate to be at most one packet every 10 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 icmp error-interval 10000
```

To reset the rate to the default of one packet every second, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 icmp error-interval
```

Related commands [ip icmp error-interval](#)

ipv6 multicast forward-slow-path-packet

Overview Use this command to enable multicast packets to be forwarded to the CPU. Enabling this command will ensure that the Layer 3 MTU is set correctly for each IP multicast group and will apply the value of the smallest MTU among the outgoing interfaces for the multicast group.

It will also ensure that a received packet that is larger than the MTU value will result in the generation of an ICMP Too Big message.

Use the **no** variant of this command to disable the above functionality.

Syntax `ipv6 multicast forward-slow-path-packet`
`no ipv6 multicast forward-slow-path-packet`

Default Disabled.

Mode Privileged Exec

Example To enable the ipv6 multicast forward-slow-path-packet function, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast forward-slow-path-packet
```

Related commands [show ipv6 forwarding](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 nd accept-ra-default-routes

Overview Use this command to allow accepting and installing of default routes based on a received RA (Router Advertisement). The default route's destination is set to the source address of the received RA.

Use the **no** variant of this command to disable accepting RA-based default routes.

Syntax `ipv6 nd accept-ra-default-routes`
`no ipv6 nd accept-ra-default-routes`

Default RA-based default routes are accepted by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To enable RA-based default routes on vlan1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ipv6 enable
awplus(config-if)# no ipv6 nd accept-ra-pinfo
```

Related commands [ipv6 address](#)
[ipv6 address autoconfig](#)
[ipv6 enable](#)

ipv6 nd accept-ra-pinfo

Overview Use this command to allow the processing of the prefix information included in a received RA (Router Advertisement) on an IPv6 enabled interface.

Use the **no** variant of this command to disable an IPv6 interface from using the prefix information within a received RA.

Syntax `ipv6 nd accept-ra-pinfo`
`no ipv6 nd accept-ra-pinfo`

Default The command **ipv6 nd accept-ra-pinfo** is enabled by default on any IPv6 interface.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes By default, when IPv6 is enabled on an interface, SLAAC is also enabled. SLAAC addressing along with the EUI-64 process, uses the prefix information included in a received RA to generate an automatic link-local address on the IPv6 interface.

Note: an AlliedWare Plus device will, by default, add a prefix for the connected interface IPv6 address(es) to the RA it transmits. However, this behavior can be changed by using the command **no ipv6 nd prefix auto-advertise**, so there is no guarantee that an RA will contain a prefix.

Example To enable IPv6 on vlan1 without installing a SLAAC address on the interface, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ipv6 enable
awplus(config-if)# no ipv6 nd accept-ra-pinfo
```

Related commands [ipv6 address](#)
[ipv6 address autoconfig](#)
[ipv6 enable](#)

Command changes Version 5.4.7-0.1: command added

ipv6 nd current-hoplimit

Overview Use this command to specify the advertised current hop limit used between IPv6 Routers.

Use the **no** variant of this command to reset the current advertised hop limit to the default of 0, which means no advertised current hop limit is specified.

Syntax `ipv6 nd current-hoplimit <hoplimit>`
`no ipv6 nd current-hoplimit`

Parameter	Description
<hoplimit>	Specifies the advertised current hop limit value. Valid values are from 0 to 255 hops.

Default 0 (No advertised current hop limit specified)

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the advertised current hop limit to 2 between IPv6 Routers on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd current-hoplimit 2
```

To reset the advertised current hop limit to the default 0 on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd current-hoplimit
```

Related commands [ipv6 nd managed-config-flag](#)
[ipv6 nd prefix](#)
[ipv6 nd suppress-ra](#)

ipv6 nd dns search-list

Overview Use this command to specify a DNS Search List (DNSSL) to be included in the Router Advertisement for a given IPv6 interface.

Use the **no** variant of this command to remove a specified domain name. If no domain name is specified, then all domain names previously added will be deleted.

Syntax `ipv6 nd dns search-list <domain-name>`
`no ipv6 nd dns search-list [<domain-name>]`

Parameter	Description
<code><domain-name></code>	A string specifying the domain name to be added to the search list. For example, myexample.com

Default No domain search list is included in router advertisements from any interface.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To add the domain name 'myexample.com' to the search list for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd dns search-list myexample.com
```

To delete all domain names added previously, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd dns search-list
```

Related commands [ipv6 nd suppress-ra](#)

Command changes Version 5.5.0-2.5: command added

ipv6 nd dns-server

Overview Use this command to advertise (in Router Advertisement messages) a DNS server for downstream devices to use.

You can specify either a static IPv6 address or the lowest address from an interface.

Use the **no** variant of this command to delete one or all DNS server addresses.

Syntax `ipv6 nd dns-server {<int>|<ip-add>}`
`no ipv6 nd dns-server [<int>|<ip-add>]`

Parameter	Description
<int>	Advertise the lowest IPv6 address on the selected interface as a DNS server for downstream devices.
<ip-add>	Advertise a particular IPv6 address as a DNS server for downstream devices.

Default No DNS servers are advertised.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To configure vlan2 to send RAs and advertise itself as a DNS server, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd suppress-ra
awplus(config-if)# no ipv6 nd accept-ra-pinfo
awplus(config-if)# ipv6 address 2001:DB8::1/64
awplus(config-if)# ipv6 nd dns-server vlan2
```

To configure vlan2 to send RAs and advertise 2001:DB8::2 as a DNS server, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd suppress-ra
awplus(config-if)# no ipv6 nd accept-ra-pinfo
awplus(config-if)# ipv6 address 2001:DB8::1/64
awplus(config-if)# ipv6 nd dns-server 2001:DB8::2
```

To stop advertising any DNS servers on the selected interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd dns-server
```

Related commands [ipv6 nd accept-ra-pinfo](#)
[ipv6 nd suppress-ra](#)
[show ipv6 interface](#)

ipv6 nd managed-config-flag

Overview Use this command to set the managed address configuration flag, contained within the router advertisement field.

Setting this flag indicates the operation of a stateful autoconfiguration protocol such as DHCPv6 for address autoconfiguration, and that address information (i.e. the network prefix) and other (non-address) information can be requested from the device.

An unset flag enables hosts receiving the advertisements to use a stateless autoconfiguration mechanism to establish their IPv6 addresses. The default is flag unset.

Use the **no** variant of this command to reset this command to its default of having the flag unset.

Syntax `ipv6 nd managed-config-flag`
`no ipv6 nd managed-config-flag`

Default Unset

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes To enable the transmission of router advertisements, you must apply the **no** version of the **ipv6 nd suppress-ra**. This step is included in the example below.

Example To set the managed address configuration flag on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd managed-config-flag
awplus(config-if)# no ipv6 nd suppress-ra
```

Related commands **ipv6 nd suppress-ra**
ipv6 nd prefix
ipv6 nd other-config-flag

ipv6 nd minimum-ra-interval

Overview Use this command in Interface Configuration mode to set a minimum Router Advertisement (RA) interval for an interface.

Use the **no** variant of this command in Interface Configuration mode to remove the minimum RA interval for an interface.

Syntax `ipv6 nd minimum-ra-interval <seconds>`
`no ipv6 nd minimum-ra-interval`

Parameter	Description
<seconds>	Specifies the number of seconds between IPv6 Router Advertisements (RAs). Valid values are from 3 to 1350 seconds.

Default The RA interval for an interface is unset by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the minimum RA interval for the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd minimum-ra-interval 60
```

To remove the minimum RA interval for the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd minimum-ra-interval
```

Related commands

- [ipv6 nd ra-interval](#)
- [ipv6 nd suppress-ra](#)
- [ipv6 nd prefix](#)
- [ipv6 nd other-config-flag](#)

ipv6 nd other-config-flag

Overview Use this command to set the **other** stateful configuration flag (contained within the router advertisement field) to be used for IPv6 address auto-configuration. This flag is used to request the router to provide information in addition to providing addresses.

Setting the **ipv6 nd managed-config-flag** implies that the **ipv6 nd other-config-flag** will also be set.

Use **no** variant of this command to reset the value to the default.

Syntax `ipv6 nd other-config-flag`
`no ipv6 nd other-config-flag`

Default Unset

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes To enable the transmission of router advertisements, you must apply the **no** version of the **ipv6 nd suppress-ra**. This step is included in the example below.

Example To set the IPv6 other-config-flag on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd other-config-flag
awplus(config-if)# no ipv6 nd suppress-ra
```

Related commands **ipv6 nd suppress-ra**
ipv6 nd prefix
ipv6 nd managed-config-flag

ipv6 nd prefix

Overview Use this command in Interface Configuration mode to specify the IPv6 prefix information that is advertised by the router advertisement for IPv6 address auto-configuration.

Use the **no** parameter with this command to reset the IPv6 prefix for an interface in Interface Configuration mode.

Syntax `ipv6 nd prefix <ipv6-prefix/length>`
`ipv6 nd prefix <ipv6-prefix/length> <valid-lifetime>`
`ipv6 nd prefix <ipv6-prefix/length> <valid-lifetime> <preferred-lifetime> [no-autoconfig]`
`ipv6 nd prefix <ipv6-prefix/length> <valid-lifetime> <preferred-lifetime> off-link [no-autoconfig]`
`no ipv6 nd prefix [<ipv6-addr/prefix-length>|all]`

Parameter	Description
<code><ipv6-prefix/length></code>	The prefix to be advertised by the router advertisement message. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64. The default is X:X::/64.
<code><valid-lifetime></code>	The the period during which the specified IPv6 address prefix is valid. This can be set to a value between 0 and 4294967295 seconds. The default is 2592000 (30 days). Note that this period should be set to a value greater than that set for the prefix preferred-lifetime.
<code><preferred-lifetime></code>	Specifies the IPv6 prefix preferred lifetime. This is the period during which the IPv6 address prefix is considered a current (undeprecated) value. After this period, the command is still valid but should not be used in new communications. Set to a value between 0 and 4294967295 seconds. The default is 604800 seconds (7 days). Note that this period should be set to a value less than that set for the prefix valid-lifetime.
<code>off-link</code>	Specify the IPv6 prefix off-link flag. The default is flag set.
<code>no-autoconfig</code>	Specify the IPv6 prefix no autoconfiguration flag. Setting this flag indicates that the prefix is not to be used for autoconfiguration. The default is flag set.
<code>all</code>	Specify all IPv6 prefixes associated with the interface.

Default Valid-lifetime default is 2592000 seconds (30 days). Preferred-lifetime default is 604800 seconds (7 days).

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes This command specifies the IPv6 prefix flags that are advertised by the router advertisement message.

Examples To configure the device to issue router advertisements on vlan2, and advertise the address prefix of 2001:0db8::/64, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd prefix 2001:0db8::/64
```

To configure the device to issue router advertisements on vlan2, and advertise the address prefix of 2001:0db8::/64 with a valid lifetime of 10 days and a preferred lifetime of 5 days, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd prefix 2001:0db8::/64 864000 432000
```

To configure the device to issue router advertisements on vlan2 and advertise the address prefix of 2001:0db8::/64 with a valid lifetime of 10 days, a preferred lifetime of 5 days, and no prefix used for autoconfiguration, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd prefix 2001:0db8::/64 864000 432000
no-autoconfig
```

To reset router advertisements on vlan2, so the address prefix of 2001:0db8::/64 is not advertised from the device, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd prefix 2001:0db8::/64
```

To reset all router advertisements on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd prefix all
```

Related commands [ipv6 nd suppress-ra](#)

ipv6 nd ra-interval

Overview Use this command to specify the interval between IPv6 Router Advertisements (RA) transmissions.

Use **no** parameter with this command to reset the value to the default value (600 seconds).

Syntax `ipv6 nd ra-interval <seconds>`
`no ipv6 nd ra-interval`

Parameter	Description
<seconds>	Specifies the number of seconds between IPv6 Router Advertisements (RAs). Valid values are from 4 to 1800 seconds.

Default 600 seconds.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes To enable the transmission of router advertisements, you must apply the **no** version of the **ipv6 nd suppress-ra**. This step is included in the example below.

Example To set the advertisements interval on vlan2 to be 60 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd ra-interval 60
awplus(config-if)# no ipv6 nd suppress-ra
```

To reset the advertisements interval on vlan2 to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd ra-interval
```

Related commands **ipv6 nd minimum-ra-interval**
ipv6 nd suppress-ra
ipv6 nd prefix

ipv6 nd ra-lifetime

Overview Use this command to specify the time period that this router can usefully act as a default gateway for the network. Each router advertisement resets this time period.

Use **no** parameter with this command to reset the value to default.

Syntax `ipv6 nd ra-lifetime <seconds>`
`no ipv6 nd ra-lifetime`

Parameter	Description
<seconds>	Time period in seconds. Valid values are from 0 to 9000. Note that you should set this time period to a value greater than the value you have set using the ipv6 nd ra-interval command.

Default 1800 seconds

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes This command specifies the lifetime of the current router to be announced in IPv6 Router Advertisements.

To enable the transmission of router advertisements, you must apply the **no** version of the **ipv6 nd suppress-ra**. This step is included in the example below.

Examples To set the advertisement lifetime of 8000 seconds on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd ra-lifetime 8000
awplus(config-if)# no ipv6 nd suppress-ra
```

To reset the advertisement lifetime to the default on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd ra-lifetime
```

Related commands **ipv6 nd suppress-ra**
ipv6 nd prefix

ipv6 nd raguard

Overview Use this command to apply the Router Advertisements (RA) Guard feature from the Interface Configuration mode for a device port. This blocks all RA messages received on a device port.

For more information about RA Guard, see the [IPv6 Feature Overview and Configuration Guide](#).

Use the **no** parameter with this command to disable RA Guard for a specified device port.

Syntax `ipv6 nd raguard`
`no ipv6 nd raguard`

Default RA Guard is not disabled by default.

Mode Interface Configuration for a port.

Usage notes Router Advertisements (RAs) are used by Routers to announce themselves on the link. Applying RA Guard to a device port disallows Router Advertisements and redirect messages. RA Guard blocks RAs from untrusted hosts. Blocking RAs stops untrusted hosts from flooding malicious RAs and stops any misconfigured hosts from disrupting traffic on the local network.

Enabling RA Guard on a port blocks RAs from a connected host and indicates the port and host are untrusted. Disabling RA Guard on a port allows RAs from a connected host and indicates the port and host are trusted. Ports and hosts are trusted by default to allow RAs.

Example To enable RA Guard on port1.0.1-port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# ipv6 nd raguard
```

To verify RA Guard is enabled on port1.0.1, use the command:

```
awplus# show running-config interface port1.0.1
```

To disable RA Guard on port1.0.1-port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# no ipv6 nd raguard
```

When RA Guard is disabled on a port it is not displayed in **show running-config** output.

Output Example output from using **show running-config interface port1.0.1** to verify RA Guard:

```
!  
interface port1.0.1  
  switchport mode access  
  
  ipv6 nd raguard  
!
```

Related commands [show running-config interface](#)

ipv6 nd reachable-time

Overview Use this command to specify the reachable time in the router advertisement to be used for detecting reachability of the IPv6 neighbor. Use the **no** variant of this command to reset the value to default.

Syntax `ipv6 nd reachable-time <milliseconds>`
`no ipv6 nd reachable-time`

Parameter	Description
<milliseconds>	Time period in milliseconds. Valid values are from 1000 to 3600000. Setting this value to 0 indicates an unspecified reachable-time.

Default 0 milliseconds

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Usage notes This command specifies the reachable time of the current router to be announced in IPv6 Router Advertisements.

To enable the transmission of router advertisements, you must apply the **no ipv6 nd suppress-ra** command. This instruction is included in the example shown below.

Example To set the reachable-time in router advertisements on the VLAN interface vlan2 to be 1800000 milliseconds, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd reachable-time 1800000
awplus(config-if)# no ipv6 nd suppress-ra
```

To reset the reachable-time in router advertisements on the VLAN interface vlan2 to an unspecified reachable-time (0 milliseconds), enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd reachable-time
```

Related commands [ipv6 nd suppress-ra](#)
[ipv6 nd prefix](#)

ipv6 nd retransmission-time

Overview Use this command to specify the advertised retransmission interval for Neighbor Solicitation in milliseconds between IPv6 Routers.

Use the **no** variant of this command to reset the retransmission time to the default (1 second).

Syntax `ipv6 nd retransmission-time <milliseconds>`
`no ipv6 nd retransmission-time`

Parameter	Description
<milliseconds>	Time period in milliseconds. Valid values are from 1000 to 3600000.

Default 1000 milliseconds (1 second)

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Examples To set the retransmission-time of Neighbor Solicitation on the VLAN interface vlan2 to be 800000 milliseconds, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd retransmission-time 800000
```

To reset the retransmission-time of Neighbor Solicitation on the VLAN interface vlan2 to the default 1000 milliseconds (1 second), enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd retransmission-time
```

Related commands [ipv6 nd suppress-ra](#)
[ipv6 nd prefix](#)

ipv6 nd route-information

Overview Use this command to supply more specific route information to be included in the RA (Router Advertisement) the device sends to downstream devices on the same link/LAN.

Use the **no** variant of this command to remove some or all route information.

Syntax `ipv6 nd route-information <ipv6-prefix/length> [<0-4294967295>|infinity|default] [low|medium|high]`
`ipv6 nd route-information <ipv6-prefix/length>`
`no ipv6 nd route-information <ipv6-prefix/length>`
`no ipv6 nd route-information all`

Parameter	Description
<code><ipv6-prefix/length></code>	The IPv6 network prefix and prefix length entered in dotted decimal format for the IPv6 network prefix, then slash notation for the IPv6 prefix length in the format X:X::X/X/ M, e.g. 2001:db8::/64
<code><0-4294967295>|infinity|default</code>	The length of time in seconds (relative to the time the packet is sent) that the prefix is valid for route determination. - infinity - specifies that the route advertisement has an infinite lifetime. - default - is 3 * MaxRtrAdvInterval
<code>low|medium|high</code>	The preference value for the route information

Default No route information option is included in router advertisement on any interface.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To configure a route of 2001:DB8:1::/48 on vlan2, with a lifetime of 6000 seconds and a high preference, use the commands:

```
awplus# configure terminal
awplus(config)# int vlan2
awplus(config-if)# ipv6 nd route-information 2001:DB8:1::/48
6000 high
```

Related commands [ipv6 nd suppress-ra](#)

Command changes Version 5.5.0-2.4: command added

ipv6 nd router-preference

Overview Use this command to set the default router preference in the router advertisements sent on a particular interface. You can use this setting to decide whether devices will use this router instead of an alternative router, by giving this router and the alternative router different values.

Use the **no** variant of this command to return the router preference to its default value.

Syntax `ipv6 nd router-preference {low|medium|high}`
`no ipv6 nd router-preference`

Parameter	Description
low	(0b11) Preference for this router on this interface is low.
medium	(0b00) Preference for this router on this interface is medium.
high	(0b01) Preference for this router on this interface is high.

Default Medium

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To set the router preference to high on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 nd router-preference high
```

Related commands [ipv6 nd suppress-ra](#)
[show ipv6 interface](#)

Command changes Version 5.5.1-0.1: command added

ipv6 nd suppress-ra

Overview Use this command to inhibit IPv6 Router Advertisement (RA) transmission for the current interface. Router advertisements are used when applying IPv6 stateless auto-configuration.

Use the **no** parameter with this command to enable Router Advertisement transmission.

Syntax `ipv6 nd suppress-ra`
`no ipv6 nd suppress-ra`

Default Router Advertisement (RA) transmission is suppressed by default.

Mode Interface Configuration for a VLAN interface or a local loopback interface.

Example To enable the transmission of router advertisements from vlan2 on the device, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd suppress-ra
```

Related commands [ipv6 nd ra-interval](#)
[ipv6 nd router-preference](#)
[ipv6 nd prefix](#)

ipv6 neighbor

Overview Use this command to add a static IPv6 neighbor entry.

Use the **no** variant of this command to remove a specific IPv6 neighbor entry.

Syntax `ipv6 neighbor <ipv6-address> <vlan-name> <mac-address> <port-list>`
`no ipv6 neighbor <ipv6-address> <vlan-name> <port-list>`

Parameter	Description
<code><ipv6-address></code>	Specify the neighbor's IPv6 address in the format X:X::X:X.
<code><vlan-name></code>	Specify the neighbor's VLAN name.
<code><mac-address></code>	Specify the MAC hardware address in hexadecimal notation in the format HHHH.HHHH.HHHH.
<code><port-list></code>	Specify the port number, or port range.

Mode Global Configuration

Usage notes Use this command to clear a specific IPv6 neighbor entry. To clear all dynamic address entries, use the **clear ipv6 neighbors** command.

Example To create a static neighbor entry for IPv6 address 2001:0db8::a2, on vlan2, with MAC address 0000.cd28.0880, on port1.0.1, use the command:

```
awplus# configure terminal
awplus(config)# ipv6 neighbor 2001:0db8::a2 vlan2
0000.cd28.0880 port1.0.1
```

Related commands **clear ipv6 neighbors**
show ipv6 neighbors

ipv6 opportunistic-nd

Overview Use this command to enable opportunistic neighbor discovery for the global IPv6 ND cache. Opportunistic neighbor discovery changes the behavior for unsolicited ICMPv6 ND packet forwarding on the device.

Use the **no** variant of this command to disable opportunistic neighbor discovery for the global IPv6 ND cache.

Syntax `ipv6 opportunistic-nd`
`no ipv6 opportunistic-nd`

Default Opportunistic neighbor discovery is disabled by default.

Mode Global Configuration

Usage notes When opportunistic neighbor discovery is enabled, the device will reply to any received unsolicited ICMPv6 ND packets. The source MAC address for the unsolicited ICMPv6 ND packet is added to the IPv6 ND cache, so the device forwards the ICMPv6 ND packet. When opportunistic neighbor discovery is disabled, the source MAC address for the ICMPv6 packet is not added to the IPv6 ND cache, so the ICMPv6 ND packet is not forwarded by the device.

Examples To enable opportunistic neighbor discovery for the IPv6 ND cache, enter:

```
awplus# configure terminal
awplus(config)# ipv6 opportunistic-nd
```

To disable opportunistic neighbor discovery for the IPv6 ND cache, enter:

```
awplus# configure terminal
awplus(config)# no ipv6 opportunistic-nd
```

Related commands `arp opportunistic-nd`
`show ipv6 neighbors`
`show running-config interface`

ipv6 route

Overview This command adds a static IPv6 route to the Routing Information Base (RIB). If this route is the best route for the destination, then your device adds it to the Forwarding Information Base (FIB). Your device uses the FIB to forward packets and to advertise routes to neighbors.

The **no** variant of this command removes the static route.

Syntax `ipv6 route <dest-prefix/length> {<gateway-ip>|<gateway-name>} [<src-prefix/length>] [<distvalue>] [description <description>]`
`no ipv6 route <dest-prefix/length> {<gateway-ip>|<gateway-name>} [<src-prefix/length>] [<distvalue>]`

Parameter	Description
<i><dest-prefix/length></i>	Specifies the destination prefix. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<i><gateway-ip></i>	Specifies the address of the gateway (or next hop). The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<i><gateway-name></i>	Specifies the name of the interface for the gateway (or next hop).
<i><src-prefix/length></i>	Specifies the source prefix. This is used for SADR - see the Usage notes. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<i><distvalue></i>	Specifies the administrative distance for the route. Valid values are from 1 to 255. You can use administrative distance to determine which routes take priority over other routes. The route with the lowest distance value is used.
description <i><description></i>	A description to record the route's purpose. It can be up to 80 printable ASCII characters long, including spaces. The description does not affect routing or forwarding decisions made by the device. To see the description, use the command show running-configuration .

Mode Global Configuration

Usage notes You can configure IPv6 static routes for Source Address Dependent Routing (SADR) by providing a source prefix. In 'normal' routing, when the device searches routes for a next hop to forward a packet to, the device chooses the next hop based only on the destination address of the packet. When you provide SADR information for a route, the device also inspects the source address and ensures it fits within the source prefix range you provided for this route.

Versions of AlliedWare Plus earlier than 5.5.1-2.1 do not support descriptions on static routes, so a start-up configuration that contains descriptions will be rejected by these older versions. If you add descriptions, be careful if you downgrade to an older AlliedWare Plus version.

Example To create a route with administrative distance of 32 to send packets to 2001:0db8::1/128 via vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2 32
```

To use SADR to create a route for packets from 2001::/64 to 2223::/64, with a next hop of 2001::1, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2223::/64 2001::1 2001::/64
```

To give a route a description of 'test' when creating it, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2 description
test
```

To remove the description from a route, re-enter the route without specifying the **description** parameter:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2
```

Related Commands [show running-config](#)
[show ipv6 route](#)

Command changes Version 5.5.1-2.1: **description** parameter added
Version 5.5.0-0.3: **src-prefix** parameter added

ipv6 unreachables

Overview Use this command to enable ICMPv6 (Internet Control Message Protocol version 6) type 1, destination unreachable, messages.

Use the **no** variant of this command to disable destination unreachable messages. This prevents an attacker from using these messages to discover the topology of a network.

Syntax `ipv6 unreachables`
`no ipv6 unreachables`

Default Destination unreachable messages are enabled by default.

Mode Global Configuration

Usage notes When a device receives a packet for a destination that is unreachable it returns an ICMPv6 type 1 message. This message includes a reason code, as per the table below. An attacker can use these messages to obtain information regarding the topology of a network. Disabling destination unreachable messages, using the **no ipv6 unreachables** command, secures your network against this type of probing.

NOTE: *Disabling ICMPv6 destination unreachable messages breaks applications such as traceroute, which depend on these messages to operate correctly.*

ICMPv6 type 1 reason codes and description

Code	Description [RFC]
0	No route to destination [RFC4443]
1	Communication with destination administratively prohibited [RFC4443]
2	Beyond scope of source address [RFC4443]
3	Address unreachable [RFC4443]
4	Port unreachable [RFC4443]
5	Source address failed ingress/egress policy [RFC4443]
6	Reject route to destination [RFC4443]
7	Error in Source Routing Header [RFC6554]

Example To disable destination unreachable messages, use the commands

```
awplus# configure terminal  
awplus(config)# no ipv6 unreachable
```

To enable destination unreachable messages, use the commands

```
awplus# configure terminal  
awplus(config)# ipv6 unreachable
```

optimistic-nd

Overview Use this command to enable the optimistic neighbor discovery feature for both IPv4 and IPv6.

Use the **no** variant of this command to disable the optimistic neighbor discovery feature.

Syntax optimistic-nd
no optimistic-nd

Default The optimistic neighbor discovery feature is enabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes The optimistic neighbor discovery feature allows the device, after learning an IPv4 or IPv6 neighbor, to refresh the neighbor before the neighbor is deleted from the hardware L3 switching table. The device puts the neighbor entry into the 'stale' state in the software switching table if it is not refreshed, then the 'stale' neighbors are deleted from the hardware L3 switching table.

The optimistic neighbor discovery feature enables the device to sustain L3 traffic switching to a neighbor without interruption. Without the optimistic neighbor discovery feature enabled L3 traffic is interrupted when a neighbor is 'stale' and is then deleted from the L3 switching table.

If a neighbor receiving optimistic neighbor solicitations does not answer optimistic neighbor solicitations with neighbor advertisements, then the neighbor will be put into the 'stale' state, and subsequently deleted from both the software and the hardware L3 switching tables.

Examples To enable the optimistic neighbor discovery feature on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# optimistic-nd
```

To disable the optimistic neighbor discovery feature on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no optimistic-nd
```

Related commands [show running-config](#)

ping ipv6

Overview This command sends a query to another IPv6 host (send Echo Request messages).

Syntax ping ipv6 {<host>|<ipv6-address>} [repeat {<1-2147483647>|continuous}] [size <10-1452>] [interface <interface-list>] [timeout <1-65535>]

Parameter	Description
<ipv6-addr>	The destination IPv6 address. The IPv6 address uses the format X:X::X:X.
<hostname>	The destination hostname.
repeat	Specify the number of ping packets to send.
<1-2147483647>	Specify repeat count. The default is 5.
size <10-1452>	The number of data bytes to send, excluding the 8 byte ICMP header. The default is 56 (64 ICMP data bytes).
interface <interface-list>	The interface or range of configured IP interfaces to use as the source in the IP header of the ping packet. The interface can be one of: • a VLAN (e.g. vlan2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. You can only specify the interface when pinging a link local address.
timeout <1-65535>	The time in seconds to wait for echo replies if the ARP entry is present, before reporting that no reply was received. If no ARP entry is present, it does not wait.
repeat	Specify the number of ping packets to send.
<1-2147483647>	Specify repeat count. The default is 5.
continuous	Continuous ping.
size <10-1452>	The number of data bytes to send, excluding the 8 byte ICMP header. The default is 56 (64 ICMP data bytes).
timeout <1-65535>	The time in seconds to wait for echo replies if the ARP entry is present, before reporting that no reply was received. If no ARP entry is present, it does not wait.

Mode User Exec and Privileged Exec

Example awplus# ping ipv6 2001:0db8::a2

Related commands traceroute ipv6

show ipv6 forwarding

Overview Use this command to display IPv6 forwarding status.

Syntax show ipv6 forwarding

Mode User Exec and Privileged Exec

Example awplus# show ipv6 forwarding

Output The following shows typical output.

Example output from the show ipv6 forwarding command

```
awplus#show ipv6 forwarding
ipv6 forwarding is on
```

show ipv6 interface

Overview Use this command to display brief information about interfaces and the IPv6 address assigned to them.

Syntax `show ipv6 interface [brief|<interface-list>] [nd]`

Parameter	Description
brief	Specify this optional parameter to display brief IPv6 interface information.
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list. The specified interfaces must exist.
nd	Specify this optional parameter for Neighbor Discovery configurations.

Mode User Exec and Privileged Exec

Examples To display a brief list of all interfaces on a device, use the following command:

```
awplus# show ipv6 interface brief
```

Output The following shows typical output.

Example output from the show ipv6 interface brief command

awplus#show ipv6 interface brief			
Interface	IPv6-Address	Status	Protocol
lo	unassigned	admin up	running
vlan1	2001:db8::1/48	admin up	down
	fe80::215:77ff:fee9:5c50/64		

Related commands [ipv6 nd router-preference](#)
[show interface brief](#)

show ipv6 neighbors

Overview Use this command to display all IPv6 neighbors.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 neighbors

Mode User Exec and Privileged Exec

Example To display a device’s IPv6 neighbors, use the following command:

```
awplus# show ipv6 neighbors
```

Output The following shows typical output.

Example output of the show ipv6 neighbors command

IPv6 Address	MAC Address	Interface	Port	Type
fe80::290:bff:fe3e:44dc	0090.0b3e.44dc	vlan1	po3	dynamic
fd32:b1f0:dff7:ab03::1	0090.0b3e.44dc	vlan1	po3	dynamic
fe80::2	eccd.6ddf.6d41	vlan2	po4	static

Related commands [clear ipv6 neighbors](#)
[ipv6 neighbor](#)

show ipv6 route

Overview Use this command to display the IPv6 routing table for a protocol or from a particular table.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 route [connected|database|ospf|rip|static|summary|<ipv6-address>|<ipv6-prefix/prefix-length>]`

Parameter	Description
connected	Displays only the routes learned from connected interfaces.
database	Displays only the IPv6 routing information extracted from the database.
ospf	Displays only the routes learned from OSPFv3.
rip	Displays only the routes learned from RIPng.
static	Displays only the IPv6 static routes you have configured.
summary	Displays summary information from the IPv6 routing table.
<ipv6-address>	Displays the routes for the specified address in the IPv6 routing table.
<ipv6-prefix>/<prefix-length>	Displays only the routes for the specified IPv6 prefix.

Mode User Exec and Privileged Exec

Example To display all IPv6 routes with all parameters turned on, use the following command:

```
awplus# show ipv6 route
```

To display all database entries for all IPv6 routes, use the following command:

```
awplus# show ipv6 route database
```

Output The following shows typical output.

Example output of the show ipv6 route command

```
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, B - BGP
S   ::/0 [1/0] via 2001::a:0:0:c0a8:a6, vlan10
C   2001:db8::a:0:0:0:0/64 via ::, vlan10
C   2001:db8::14:0:0:0:0/64 via ::, vlan20
C   2001:db8::0:0:0:0:0/64 via ::, vlan30
C   2001:db8::28:0:0:0:0/64 via ::, vlan40
C   2001:db8::fa:0:0:0:0/64 via ::, vlan250
C   2001:db8::/64 via ::, vlan250
C   2001:db8::/64 via ::, vlan40
C   2001:db8::/64 via ::, vlan20
C   2001:db8::/64 via ::, vlan10
```

Output The following shows typical output.

Example output of the show ipv6 route database command

```
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, B - BGP
> - selected route, * - FIB route, p - stale info
Timers: Uptime
S   ::/0 [1/0] via 2001::a:0:0:c0a8:a01 inactive, 6d22h12m
      [1/0] via 2001::fa:0:0:c0a8:fa01 inactive, 6d22h12m
```

Related commands [ipv6 address](#)
[ipv6 route](#)

show ipv6 route summary

Overview Use this command to display the summary of the current NSM RIB entries. For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 route summary

Mode User Exec and Privileged Exec

Example To display IP route summary, use the following command:
awplus# show ipv6 route summary

Output The following shows typical output.

Example output from the show ipv6 route summary command

```
IPv6 routing table name is Default-IPv6-Routing-Table(0)
IPv6 routing table maximum-paths is 4
RouteSource      Networks
connected        4
rip               5
Total            9
FIB              5
```

Related commands [show ip route database](#)

traceroute ipv6

Overview Use this command to trace the route to the specified IPv6 host.

Syntax `traceroute ipv6 {<ipv6-addr>|<hostname>}`

Parameter	Description
<code><ipv6-addr></code>	The destination IPv6 address. The IPv6 address uses the format X:X::X:X.
<code><hostname></code>	The destination hostname.

Mode User Exec and Privileged Exec

Example To run a traceroute for the IPv6 address 2001:0db8::a2, use the following command:

```
awplus# traceroute ipv6 2001:0db8::a2
```

Related commands [ping ipv6](#)

23

Routing Commands

- Contents**
- **Introduction** on page 1045
 - **ip resolve-via-default** on page 1046
 - **ip route** on page 1047
 - **ipv6 route** on page 1049
 - **max-fib-routes** on page 1051
 - **max-static-routes** on page 1052
 - **maximum-paths** on page 1053
 - **show ip resolve-via-default** on page 1054
 - **show ip route** on page 1055
 - **show ip route database** on page 1058
 - **show ip route summary** on page 1060
 - **show ipv6 route** on page 1061
 - **show ipv6 route summary** on page 1063

Introduction

Overview This chapter provides an alphabetical reference of routing commands that are common across the routing IP protocols. For more information, see the [Route Selection Feature Overview and Configuration Guide](#).

ip resolve-via-default

Overview Use this command to enable a routing protocol (most likely BGP) to use a default route to resolve next hops.

This command affects recursive routes, which are routes where the next hop is defined in terms of another IP address, and therefore resolving the next hop requires another route lookup. Recursive routes are most common in BGP but can occur in other routing protocols too.

Use the **no** variant of this command to stop the protocol from using a default route to resolve next hops. This can be helpful when such use can lead to inappropriate next hops being incorrectly activated.

Syntax `ip resolve-via-default`
`no ip resolve-via-default`

Default Enabled

Mode Global Configuration

Usage notes This command's effect is not instantaneous. Changing this setting does not result in an recalculation of all routes. Instead, the command will only result in changes when routes are recalculated, or if you manually restart the routing protocol.

Example To stop the device from using default routes to resolve next hops, use the commands:

```
awplus# configure terminal
awplus(config)# no ip resolve-via-default
```

To allow the device to use default routes to resolve next hops again, use the commands:

```
awplus# configure terminal
awplus(config)# ip resolve-via-default
```

Related commands [show ip resolve-via-default](#)

Command changes Version 5.5.3-0.1: command added

ip route

Overview This command adds a static route to the Routing Information Base (RIB). If this route is the best route for the destination, then your device adds it to the Forwarding Information Base (FIB). Your device uses the FIB to advertise routes to neighbors and forward packets.

The **no** variant of this command removes the static route from the RIB and FIB.

Syntax `ip route <subnet&mask> {<gateway-ip>|<interface>} [<distance>]
[description <description>]
no ip route <subnet&mask> {<gateway-ip>|<interface>}
[<distance>]`

Parameter	Description
<subnet&mask>	The IPv4 address of the destination subnet defined using either a prefix length or a separate mask specified in one of the following formats: • The IPv4 subnet address in dotted decimal notation followed by the subnet mask, also in dotted decimal notation. • The IPv4 subnet address in dotted decimal notation, followed by a forward slash, then the prefix length.
<gateway-ip>	The IPv4 address of the gateway device.
<interface>	The interface that connects your device to the network. For a VLAN, enter the name of the VLAN or its VID. You can also enter 'null' as an interface. Specify a 'null' interface to add a null or blackhole route to the device. The gateway IP address or the interface is required.
<distance>	The administrative distance for the static route in the range 1 to 255. Static routes by default have an administrative distance of 1, which gives them the highest priority possible.
description <description>	A description to record the route's purpose. It can be up to 80 printable ASCII characters long, including spaces. The description does not affect routing or forwarding decisions made by the device. To see the description, use the command show running-configuration .

Mode Global Configuration

Default The default administrative distance for a static route is 1.

Usage notes You can use administrative distance to determine which routes take priority over other routes.

Specify a 'Null' interface to add a null or blackhole route to the switch. A null or blackhole route is a routing table entry that does not forward packets, so any packets sent to it are dropped.

Versions of AlliedWare Plus earlier than 5.5.1-2.1 do not support descriptions on static routes, so a start-up configuration that contains descriptions will be rejected by these older versions. If you add descriptions, be careful if you downgrade to an older AlliedWare Plus version.

Examples To add the destination 192.168.3.0 with the mask 255.255.255.0 as a static route available through the device at 10.10.0.2 with the default administrative distance, use the commands:

```
awplus# configure terminal
awplus(config)# ip route 192.168.3.0 255.255.255.0 10.10.0.2
```

To remove the destination 192.168.3.0 with the mask 255.255.255.0 as a static route available through the device at 10.10.0.2 with the default administrative distance, use the commands:

```
awplus# configure terminal
awplus(config)# no ip route 192.168.3.0 255.255.255.0 10.10.0.2
```

To specify a null or blackhole route 192.168.4.0/24, so packets forwarded to this route are dropped, use the commands:

```
awplus# configure terminal
awplus(config)# ip route 192.168.4.0/24 null
```

To add the destination 192.168.3.0 with the mask 255.255.255.0 as a static route available through the device at 10.10.0.2 with an administrative distance of 128, use the commands:

```
awplus# configure terminal
awplus(config)# ip route 192.168.3.0 255.255.255.0 10.10.0.2 128
```

To give a route a description of 'test' when creating it, use the commands:

```
awplus# configure terminal
awplus(config)# ip route 192.168.3.0/24 10.10.0.2 description
test
```

To remove the description from a route, re-enter the route without specifying the **description** parameter:

```
awplus# configure terminal
awplus(config)# ip route 192.168.3.0/24 10.10.0.2
```

Related commands [show ip route](#)
[show ip route database](#)

ipv6 route

Overview This command adds a static IPv6 route to the Routing Information Base (RIB). If this route is the best route for the destination, then your device adds it to the Forwarding Information Base (FIB). Your device uses the FIB to forward packets and to advertise routes to neighbors.

The **no** variant of this command removes the static route.

Syntax `ipv6 route <dest-prefix/length> {<gateway-ip>|<gateway-name>} [<src-prefix/length>] [<distvalue>] [description <description>]`
`no ipv6 route <dest-prefix/length> {<gateway-ip>|<gateway-name>} [<src-prefix/length>] [<distvalue>]`

Parameter	Description
<i><dest-prefix/length></i>	Specifies the destination prefix. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<i><gateway-ip></i>	Specifies the address of the gateway (or next hop). The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<i><gateway-name></i>	Specifies the name of the interface for the gateway (or next hop).
<i><src-prefix/length></i>	Specifies the source prefix. This is used for SADR - see the Usage notes. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<i><distvalue></i>	Specifies the administrative distance for the route. Valid values are from 1 to 255. You can use administrative distance to determine which routes take priority over other routes. The route with the lowest distance value is used.
description <i><description></i>	A description to record the route's purpose. It can be up to 80 printable ASCII characters long, including spaces. The description does not affect routing or forwarding decisions made by the device. To see the description, use the command show running-configuration .

Mode Global Configuration

Usage notes You can configure IPv6 static routes for Source Address Dependent Routing (SADR) by providing a source prefix. In 'normal' routing, when the device searches routes for a next hop to forward a packet to, the device chooses the next hop based only on the destination address of the packet. When you provide SADR information for a route, the device also inspects the source address and ensures it fits within the source prefix range you provided for this route.

Versions of AlliedWare Plus earlier than 5.5.1-2.1 do not support descriptions on static routes, so a start-up configuration that contains descriptions will be rejected by these older versions. If you add descriptions, be careful if you downgrade to an older AlliedWare Plus version.

Example To create a route with administrative distance of 32 to send packets to 2001:0db8::1/128 via vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2 32
```

To use SADR to create a route for packets from 2001::/64 to 2223::/64, with a next hop of 2001::1, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2223::/64 2001::1 2001::/64
```

To give a route a description of 'test' when creating it, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2 description
test
```

To remove the description from a route, re-enter the route without specifying the **description** parameter:

```
awplus# configure terminal
awplus(config)# ipv6 route 2001:0db8::1/128 vlan2
```

**Related
Commands** [show running-config](#)
[show ipv6 route](#)

**Command
changes** Version 5.5.1-2.1: **description** parameter added
Version 5.5.0-0.3: **src-prefix** parameter added

max-fib-routes

Overview This command enables you to control the maximum number of FIB routes configured. It operates by providing parameters that enable you to configure preset maximums and warning message thresholds.

NOTE: For static routes use the command.

Use the **no** variant of this command to set the maximum number of FIB routes to the default of 4294967294 FIB routes.

Syntax max-fib-routes <1-4294967294> [<1-100>|warning-only]
no max-fib-routes

Parameter	Description
max-fib-routes	This is the maximum number of routes that can be stored in the device's Forwarding Information dataBase. In practice, other practical system limits would prevent this maximum being reached.
<1-4294967294>	The allowable configurable range for setting the maximum number of FIB-routes.
<1-100>	This parameter enables you to optionally apply a percentage value. This percentage will be based on the maximum number of FIB routes you have specified. This will cause a warning message to appear when your routes reach your specified percentage value. Routes can continue to be added until your configured maximum value is reached.
warning-only	This parameter enables you to optionally apply a warning message. If you set this option a warning message will appear if your maximum configured value is reached. Routes can continue to be added until your device reaches either the maximum capacity value of 4294967294, or a practical system limit.

Default The default number of FIB routes is the maximum number of FIB routes (4294967294).

Mode Global Configuration

Examples To set the maximum number of dynamic routes to 2000 and warning threshold of 75%, use the following commands:

```
awplus# config terminal
awplus(config)# max-fib-routes 2000 75
```

max-static-routes

Overview Use this command to set the maximum number of static routes, excluding FIB (Forwarding Information Base) routes.

NOTE: For FIB routes use the command.

Use the **no** variant of this command to set the maximum number of static routes to the default of 1000 static routes.

Syntax max-static-routes <1-1000>
no max-static-routes

Default The default number of static routes is the maximum number of static routes (1000).

Mode Global Configuration

Example To reset the maximum number of static routes to the default maximum, use the command:

```
awplus# configure terminal
awplus(config)# no max-static-routes
```

NOTE: Static routes are applied before adding routes to the RIB (Routing Information Base). Therefore, rejected static routes will not appear in the running config.

Related commands [max-fib-routes](#)

maximum-paths

Overview This command enables ECMP on your device, and sets the maximum number of paths that each route has in the Forwarding Information Base (FIB). ECMP is enabled by default.

The **no** variant of this command sets the maximum paths to the default of 4.

Syntax maximum-paths <1-8>
no maximum-paths

Parameter	Description
<1-8>	The maximum number of paths that a route can have in the FIB.

Default By default the maximum number of paths is 4.

Mode Global Configuration

Examples To set the maximum number of paths for each route in the FIB to 5, use the commands:

```
awplus# configure terminal
awplus(config)# maximum-paths 5
```

To set the maximum paths for a route to the default of 4, use the commands:

```
awplus# configure terminal
awplus(config)# no maximum-paths
```

Command changes Version 5.5.2-2.2: command added to x330 and GS970EMX series

show ip resolve-via-default

Overview Use this command to see whether it is possible to use a default route to resolve next hops in IP routing. By default it is possible, but this can be changed with the **no** variant of the command **ip resolve-via-default**.

Syntax show ip resolve-via-default

Mode User Exec

Example To show whether default routes are used to resolve next hops or not, use the command:

```
awplus# show ip resolve-via-default
```

Output The following shows typical output.

Example output from show ip resolve-via-default:

```
awplus#show ip resolve-via-default
IP resolve via default is off
```

Related commands **ip resolve-via-default**

Command changes Version 5.5.3-0.1: command added

show ip route

Overview Use this command to display routing entries in the FIB (Forwarding Information Base). The FIB contains the best routes to a destination, and your device uses these routes when forwarding traffic. You can display a subset of the entries in the FIB based on protocol.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token.

Syntax `show ip route [connected|ospf|rip|static|
<ip-addr>|<ip-addr/prefix-length>]`

Parameter	Description
connected	Displays only the routes learned from connected interfaces.
ospf	Displays only the routes learned from OSPF.
rip	Displays only the routes learned from RIP.
static	Displays only the static routes you have configured.
<ip-addr>	Displays the routes for the specified address. Enter an IPv4 address.
<ip-addr/prefix-length>	Displays the routes for the specified network. Enter an IPv4 address and prefix length.

Mode User Exec and Privileged Exec

Examples To display the static routes in the FIB, use the command:

```
awplus# show ip route static
```

To display the OSPF routes in the FIB, use the command:

```
awplus# show ip route ospf
```

Output Each entry in the output from this command has a code preceding it, indicating the source of the routing entry. For example, O indicates OSPF as the origin of the route. The first few lines of the output list the possible codes that may be seen with the route entries.

Typically, route entries are composed of the following elements:

- code
- a second label indicating the sub-type of the route
- network or host IP address
- administrative distance and metric
- next hop IP address
- outgoing interface name
- time since route entry was added

Example output from the show ip route command

```
Codes: C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       * - candidate default

O      10.10.37.0/24 [110/11] via 10.10.31.16, vlan2, 00:20:54
C      3.3.3.0/24 is directly connected, vlan1
C      10.10.31.0/24 is directly connected, vlan2
C      10.70.0.0/24 is directly connected, vlan4
O E2   14.5.1.0/24 [110/20] via 10.10.31.16, vlan2, 00:18:56
C      33.33.33.33/32 is directly connected, lo
```

Connected Route An example of a connected route entry consists of:

```
C      10.10.31.0/24 is directly connected, vlan2
```

This route entry denotes:

- Route entries for network 10.10.31.0/24 are derived from the IP address of local interface vlan2.
- These routes are marked as Connected routes (C) and always preferred over routes for the same network learned from other routing protocols.

OSPF Route An example of an OSPF route entry consists of:

```
O      10.10.37.0/24 [110/11] via 10.10.31.16, vlan2, 00:20:54
```

This route entry denotes:

- This route in the network 10.10.37.0/24 was added by OSPF.
- This route has an administrative distance of 110 and metric/cost of 11.
- This route is reachable via next hop 10.10.31.16.
- The outgoing local interface for this route is vlan2.
- This route was added 20 minutes and 54 seconds ago.

**OSPF
External
Route**

An example of an OSPF external route entry consists of:

```
0 E2    14.5.1.0/24 [110/20] via 10.10.31.16, vlan2, 00:18:56
```

This route entry denotes that this route is the same as the other OSPF route explained above; the main difference is that it is a Type 2 External OSPF route.

**Related
commands**

ip route
maximum-paths
show ip route database

show ip route database

Overview This command displays the routing entries in the RIB (Routing Information Base).

When multiple entries are available for the same prefix, RIB uses the routes' administrative distances to choose the best route. All best routes are entered into the FIB (Forwarding Information Base). To view the routes in the FIB, use the **show ip route** command.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > (output redirection token).

Syntax `show ip route database [connected|ospf|rip|static]`

Parameter	Description
connected	Displays only the routes learned from connected interfaces.
ospf	Displays only the routes learned from OSPF.
rip	Displays only the routes learned from RIP.
static	Displays only the static routes you have configured.

Mode User Exec and Privileged Exec

Example To display the static routes in the RIB, use the command:

```
awplus# show ip route database static
```

Output The following shows typical output.

Example output from the show ip route database command:

```
Codes: C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       > - selected route, * - FIB route, p - stale info

O    *> 9.9.9.9/32 [110/31] via 10.10.31.16, vlan2, 00:19:21
O    10.10.31.0/24 [110/1] is directly connected, vlan2, 00:28:20
C    *> 10.10.31.0/24 is directly connected, vlan2
S    *> 10.10.34.0/24 [1/0] via 10.10.31.16, vlan2
O    10.10.34.0/24 [110/31] via 10.10.31.16, vlan2, 00:21:19
O    *> 10.10.37.0/24 [110/11] via 10.10.31.16, vlan2, 00:21:19
C    *> 10.30.0.0/24 is directly connected, vlan6
S    *> 11.22.11.0/24 [1/0] via 10.10.31.16, vlan2
O E2 *> 14.5.1.0/24 [110/20] via 10.10.31.16, vlan2, 00:19:21
O    16.16.16.16/32 [110/11] via 10.10.31.16, vlan2, 00:21:19
S    *> 16.16.16.16/32 [1/0] via 10.10.31.16, vlan2
O    *> 17.17.17.17/32 [110/31] via 10.10.31.16, vlan2, 00:21:19
C    *> 45.45.45.45/32 is directly connected, lo
O    *> 55.55.55.55/32 [110/21] via 10.10.31.16, vlan2, 00:21:19
C    *> 127.0.0.0/8 is directly connected, lo
```

Related commands [maximum-paths](#)
[show ip route](#)

show ip route summary

Overview This command displays a summary of the current RIB (Routing Information Base) entries.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token.

Syntax show ip route summary

Mode User Exec and Privileged Exec

Example To display a summary of the current RIB entries, use the command:

```
awplus# show ip route summary
```

Output The following shows typical output.

Example output from the show ip route summary command

```
IP routing table name is Default-IP-Routing-Table(0)
IP routing table maximum-paths is 4
Route Source      Networks
connected         5
ospf               2
Total             8
```

Related commands [show ip route](#)
[show ip route database](#)

show ipv6 route

Overview Use this command to display the IPv6 routing table for a protocol or from a particular table.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 route [connected|database|ospf|rip|static|summary|<ipv6-address>|<ipv6-prefix/prefix-length>]`

Parameter	Description
connected	Displays only the routes learned from connected interfaces.
database	Displays only the IPv6 routing information extracted from the database.
ospf	Displays only the routes learned from OSPFv3.
rip	Displays only the routes learned from RIPng.
static	Displays only the IPv6 static routes you have configured.
summary	Displays summary information from the IPv6 routing table.
<ipv6-address>	Displays the routes for the specified address in the IPv6 routing table.
<ipv6-prefix>/<prefix-length>	Displays only the routes for the specified IPv6 prefix.

Mode User Exec and Privileged Exec

Example To display all IPv6 routes with all parameters turned on, use the following command:

```
awplus# show ipv6 route
```

To display all database entries for all IPv6 routes, use the following command:

```
awplus# show ipv6 route database
```

Output The following shows typical output.

Example output of the show ipv6 route command

```
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, B - BGP
S   ::/0 [1/0] via 2001::a:0:0:c0a8:a6, vlan10
C   2001:db8::a:0:0:0:0/64 via ::, vlan10
C   2001:db8::14:0:0:0:0/64 via ::, vlan20
C   2001:db8::0:0:0:0:0/64 via ::, vlan30
C   2001:db8::28:0:0:0:0/64 via ::, vlan40
C   2001:db8::fa:0:0:0:0/64 via ::, vlan250
C   2001:db8::/64 via ::, vlan250
C   2001:db8::/64 via ::, vlan40
C   2001:db8::/64 via ::, vlan20
C   2001:db8::/64 via ::, vlan10
```

Output The following shows typical output.

Example output of the show ipv6 route database command

```
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, B - BGP
> - selected route, * - FIB route, p - stale info
Timers: Uptime
S   ::/0 [1/0] via 2001::a:0:0:c0a8:a01 inactive, 6d22h12m
      [1/0] via 2001::fa:0:0:c0a8:fa01 inactive, 6d22h12m
```

Related commands [ipv6 address](#)
[ipv6 route](#)

show ipv6 route summary

Overview Use this command to display the summary of the current NSM RIB entries. For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 route summary

Mode User Exec and Privileged Exec

Example To display IP route summary, use the following command:
awplus# show ipv6 route summary

Output The following shows typical output.

Example output from the show ipv6 route summary command

```
IPv6 routing table name is Default-IPv6-Routing-Table(0)
IPv6 routing table maximum-paths is 4
RouteSource      Networks
connected        4
rip              5
Total            9
FIB              5
```

Related commands [show ip route database](#)

24

RIP Commands

- Contents**
- **Introduction** on page 1066
 - **accept-lifetime** on page 1067
 - **alliedware-behavior** on page 1069
 - **cisco-metric-behavior (RIP)** on page 1071
 - **clear ip rip route** on page 1072
 - **debug rip** on page 1073
 - **default-information originate (RIP)** on page 1074
 - **default-metric (RIP)** on page 1075
 - **distance (RIP)** on page 1076
 - **distribute-list (RIP)** on page 1077
 - **fullupdate (RIP)** on page 1079
 - **ip summary-address rip** on page 1080
 - **ip prefix-list** on page 1082
 - **ip rip authentication key-chain** on page 1084
 - **ip rip authentication mode** on page 1086
 - **ip rip authentication string** on page 1088
 - **ip rip receive-packet** on page 1090
 - **ip rip receive version** on page 1091
 - **ip rip send-packet** on page 1092
 - **ip rip send version** on page 1093
 - **ip rip send version 1-compatible** on page 1095
 - **ip rip split-horizon** on page 1097
 - **key** on page 1098
 - **key chain** on page 1099
 - **key-string** on page 1100
 - **maximum-prefix** on page 1101
 - **neighbor (RIP)** on page 1102
 - **network (RIP)** on page 1103
 - **offset-list (RIP)** on page 1104
 - **passive-interface (RIP)** on page 1105
 - **recv-buffer-size (RIP)** on page 1106
 - **redistribute (RIP)** on page 1107
 - **restart rip graceful** on page 1108
 - **rip restart grace-period** on page 1109
 - **route (RIP)** on page 1110
 - **router rip** on page 1111
 - **send-lifetime** on page 1112

- **service rip** on page 1114
- **show debugging rip** on page 1115
- **show ip prefix-list** on page 1116
- **show ip protocols rip** on page 1117
- **show ip rip** on page 1118
- **show ip rip database** on page 1119
- **show ip rip interface** on page 1120
- **timers (RIP)** on page 1121
- **undebg rip** on page 1123
- **version (RIP)** on page 1124

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure RIP.

For information about configuring RIP, see the [RIP Feature Overview and Configuration Guide](#).

accept-lifetime

Overview Use this command to specify the time period during which the authentication key on a key chain is received as valid.

Use the **no** variant of this command to remove a specified time period for an authentication key on a key chain as set previously with the **accept-lifetime** command.

Syntax `accept-lifetime <start-date> {<end-date>|
duration <seconds>|infinite}`
`no accept-lifetime`

Parameter	Description								
<code><start-date></code>	Specifies the start time and date in the format: <code><hh:mm:ss> <day> <month> <year></code> or <code><hh:mm:ss> <month> <day> <year></code> , where: <table><tr><td><code><hh:mm:ss></code></td><td>The time of the day, in hours, minutes and seconds</td></tr><tr><td><code><day></code></td><td><code><1-31></code> The day of the month</td></tr><tr><td><code><month></code></td><td>The month of the year (the first three letters of the month, for example, Jan)</td></tr><tr><td><code><year></code></td><td><code><1993-2035></code> The year</td></tr></table>	<code><hh:mm:ss></code>	The time of the day, in hours, minutes and seconds	<code><day></code>	<code><1-31></code> The day of the month	<code><month></code>	The month of the year (the first three letters of the month, for example, Jan)	<code><year></code>	<code><1993-2035></code> The year
<code><hh:mm:ss></code>	The time of the day, in hours, minutes and seconds								
<code><day></code>	<code><1-31></code> The day of the month								
<code><month></code>	The month of the year (the first three letters of the month, for example, Jan)								
<code><year></code>	<code><1993-2035></code> The year								
<code><end-date></code>	Specifies the end time and date in the format: <code><hh:mm:ss> <day> <month> <year></code> or <code><hh:mm:ss> <month> <day> <year></code> , where: <table><tr><td><code><hh:mm:ss></code></td><td>The time of the day, in hours, minutes and seconds</td></tr><tr><td><code><day></code></td><td><code><1-31></code> The day of the month</td></tr><tr><td><code><month></code></td><td>The month of the year (the first three letters of the month, for example, Jan)</td></tr><tr><td><code><year></code></td><td><code><1993-2035></code> The year</td></tr></table>	<code><hh:mm:ss></code>	The time of the day, in hours, minutes and seconds	<code><day></code>	<code><1-31></code> The day of the month	<code><month></code>	The month of the year (the first three letters of the month, for example, Jan)	<code><year></code>	<code><1993-2035></code> The year
<code><hh:mm:ss></code>	The time of the day, in hours, minutes and seconds								
<code><day></code>	<code><1-31></code> The day of the month								
<code><month></code>	The month of the year (the first three letters of the month, for example, Jan)								
<code><year></code>	<code><1993-2035></code> The year								
<code><seconds></code>	<code><1-2147483646></code> Duration of the key in seconds.								
<code>infinite</code>	Never expires.								

Mode Keychain-key Configuration

Examples The following examples show the setting of accept-lifetime for key 1 on the key chain named "mychain".

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)# accept-lifetime 03:03:01 Sep 3 2016
04:04:02 Oct 6 2016
```

or:

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)# accept-lifetime 03:03:01 3 Sep 2016
04:04:02 6 Oct 2016
```

Related commands

- [key](#)
- [key-string](#)
- [key chain](#)
- [send-lifetime](#)

alliedware-behavior

Overview This command configures your device to exhibit AlliedWare behavior when sending RIPv1 response/update messages. Configuring for this behavior may be necessary if you are replacing an AlliedWare device with an AlliedWare Plus device and wish to ensure consistent RIPv1 behavior.

Use the **no** variant of this command to implement AlliedWare Plus behavior.

This command has no impact on devices running RIPv2. Reception and transmission can be independently altered to conform to AlliedWare standard.

Syntax `alliedware-behavior {rip1-send|rip1-recv}`
`no alliedware-behavior {rip1-send|rip1-recv}`

Parameter	Description
<code>rip1-send</code>	Configures the router to behave in AlliedWare mode when sending update messages.
<code>rip1-recv</code>	Configures the router to behave in AlliedWare mode when receiving update messages.

Default By default when sending out RIPv1 updates on an interface, if the prefix (learned through RIPv2 or otherwise redistributed into RIP) being advertised does not match the subnetting used on the outgoing RIPv1 interface it will be filtered. The **alliedware-behavior** command returns your router's RIPv1 behavior to the AlliedWare format, where the prefix will be advertised as-is.

For example, if a RIPv1 update is being sent over interface 192.168.1.4/26, by default the prefix 192.168.1.64/26 will be advertised, but the prefix 192.168.1.144/28 will be filtered because the mask /28 does not match the interface's mask of /26. If **alliedware-behavior rip1-send** is configured, 192.168.1.144 would be sent as-is.

Mode Router Configuration

Examples To configure your device for **AlliedWare**-like behavior when sending and receiving RIPv1 update messages, enter the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# alliedware-behavior rip1-send
awplus(config-router)# alliedware-behavior rip1-recv
```

To return your device to **AlliedWare Plus**-like behavior when sending and receiving RIPv1 update messages, enter the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# no alliedware-behavior rip1-send
awplus(config-router)# no alliedware-behavior rip1-recv
```

Validation **show ip protocols rip**
Commands **show running-config**

Related **fullupdate (RIP)**
commands

cisco-metric-behavior (RIP)

Overview Use this command to enable or disable the RIP routing metric update to conform to Cisco's implementation. This command is provided to allow inter-operation with older Cisco devices that do not conform to the RFC standard for RIP route metrics.

Use the **no** variant of this command to disable this feature.

Syntax `cisco-metric-behavior {enable|disable}`
`no cisco-metric-behavior`

Parameter	Description
enable	Enables updating the metric consistent with Cisco.
disable	Disables updating the metric consistent with Cisco.

Default By default, the Cisco metric-behavior is disabled.

Mode Router Configuration

Examples To enable the routing metric update to behave as per the Cisco implementation, enter the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# cisco-metric-behavior enable
```

To disable the routing metric update to behave as per the default setting, enter the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# no cisco-metric-behavior
```

Validation Commands `show running-config`

clear ip rip route

Overview Use this command to clear specific data from the RIP routing table.

Syntax `clear ip rip route <ip-dest-network/prefix-length>`
`clear ip rip route {static|connected|rip|ospf|invalid-routes|all}`

Parameter	Description
<i><ip-dest-network/prefix-length></i>	Removes entries which exactly match this destination address from RIP routing table. Enter the IP address and prefix length of the destination network.
static	Removes static entries from the RIP routing table.
connected	Removes entries for connected routes from the RIP routing table.
rip	Removes only RIP routes from the RIP routing table.
ospf	Removes only OSPF routes from the RIP routing table.
invalid-routes	Removes routes with metric 16 immediately. Otherwise, these routes are not removed until RIP times out the route after 2 minutes.
all	Clears the entire RIP routing table.

Mode Privileged Exec

Usage notes Using this command with the **all** parameter clears the RIP table of all the routes.

Examples To clear the route 10.0.0.0/8 from the RIP routing table, use the following command:

```
awplus# clear ip rip route 10.0.0.0/8
```

debug rip

Overview Use this command to specify the options for the displayed debugging information for RIP events and RIP packets.

Use the **no** variant of this command to disable the specified debug option.

Syntax debug rip {events|nsm|<packet>|all}
no debug rip {events|nsm|<packet>|all}

Parameter	Description
events	RIP events debug information is displayed.
nsm	RIP and NSM communication is displayed.
<packet>	packet [recv|send] [detail] Specifies RIP packets only.
recv	Specifies that information for received packets be displayed.
send	Specifies that information for sent packets be displayed.
detail	Displays detailed information for the sent or received packet.
all	Displays all RIP debug information.

Default Disabled

Mode Privileged Exec and Global Configuration

Example The following example displays information about the RIP packets that are received and sent out from the device.

```
awplus# debug rip packet
```

Related commands [undebug rip](#)

default-information originate (RIP)

Overview Use this command to generate a default route into the Routing Information Protocol (RIP).

Use the **no** variant of this command to disable this feature.

Syntax default-information originate
no default-information originate

Default Disabled

Mode Router Configuration

Usage If routes are being redistributed into RIP and the router's route table contains a default route, within one of the route categories that are being redistributed, the RIP protocol will advertise this default route, irrespective of whether the **default-information originate** command has been configured or not. However, if the router has not redistributed any default route into RIP, but you want RIP to advertise a default route anyway, then use this command.

This will cause RIP to create a default route entry in the RIP database. The entry will be of type RS (Rip Static). Unless actively filtered out, this default route will be advertised out every interface that is sending RIP. Split horizon does not apply to this route, as it is internally generated. This operates quite similarly to the OSPF **default-information originate always** command.

Example awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# default-information originate

default-metric (RIP)

Overview Use this command to specify the metrics to be assigned to redistributed RIP routes.

Use the **no** variant of this command to reset the RIP metric back to its default (1).

Syntax default-metric *<metric>*
no default-metric [*<metric>*]

Parameter	Description
<i><metric></i>	<1-16> Specifies the value of the default metric.

Default By default, the RIP metric value is set to 1.

Mode RIP Router Configuration

Usage notes This command is used with the **redistribute (RIP)** command to make the routing protocol use the specified metric value for all redistributed routes, regardless of the original protocol that the route has been redistributed from.

Examples This example assigns the cost of 10 to the routes that are redistributed into RIP.

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# default-metric 10
awplus(config-router)# redistribute ospf
awplus(config-router)# redistribute connected
```

Related commands **redistribute (RIP)**

distance (RIP)

Overview This command sets the administrative distance for RIP routes. Your device uses this value to select between two or more routes to the same destination obtained from two different routing protocols. The route with the smallest administrative distance value is added to the Forwarding Information Base (FIB). For more information, see the [Route Selection Feature Overview and Configuration Guide](#).

The **no** variant of this command sets the administrative distance for the RIP route to the default of 120.

Syntax `distance <1-255> [<ip-addr/prefix-length> [<access-list>]]`
`no distance [<1-255>] [<ip-addr/prefix-length> [<access-list>]]`

Parameter	Description
<code><1-255></code>	The administrative distance value you are setting for this RIP route.
<code><ip-addr/prefix-length></code>	The network IP address and prefix-length that you are changing the administrative distance for.
<code><access-list></code>	Specifies the access-list name. This access list specifies which routes within the specified network this command applies to.

Mode RIP Router Configuration

Examples To set the administrative distance to 8 for the RIP routes within the 10.0.0.0/8 network that match the access-list "mylist", use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# distance 8 10.0.0.0/8 mylist
```

To set the administrative distance to the default of 120 for the RIP routes within the 10.0.0.0/8 network that match the access-list "mylist", use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# no distance 8 10.0.0.0/8 mylist
```


distribute-list (RIP)

Overview Use this command to filter incoming or outgoing route updates using the access-list or the prefix-list.

Use the **no** variant of this command to disable this feature.

Syntax `distribute-list {<access-list> | prefix <prefix-list>} {in|out} [<interface>]`
`no distribute-list {<access-list> | prefix <prefix-list>} {in|out} [<interface>]`

Parameter	Description
<access-list>	Specifies the IPv4 access-list number or name to use.
prefix	Filter prefixes in routing updates.
<prefix-list>	Specifies the name of the IPv4 prefix-list to use.
in	Filter incoming routing updates.
out	Filter outgoing routing updates.
<interface>	The interface on which the filtering applies.

Default Disabled

Mode RIP Router Configuration

Usage notes Filter out incoming or outgoing route updates using an access-list or a prefix-list. If you do not specify the name of the interface, the filter will be applied to all interfaces.

Examples To apply an ACL called 'myfilter' to filter incoming routing updates on VLAN2, use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# distribute-list myfilter in vlan2
```

To apply a prefix list called 'myfilter' to filter incoming routing updates on VLAN2, use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# distribute-list prefix myfilter in vlan2
```

Related **access-list extended (named)**
commands **ip prefix-list**

fullupdate (RIP)

Overview Use this command to specify which routes RIP should advertise when performing a triggered update. By default, when a triggered update is sent, RIP will only advertise those routes that have changed since the last update. When **fullupdate** is configured, the device advertises the full RIP route table in outgoing triggered updates, including routes that have not changed. This enables faster convergence times, or allows inter-operation with legacy network equipment, but at the expense of larger update messages.

Use the **no** variant of this command to disable this feature.

Syntax fullupdate
no fullupdate

Default By default this feature is disabled.

Mode RIP Router Configuration

Example To enable the fullupdate (RIP) function, use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# fullupdate
```

ip summary-address rip

Overview Use this command to configure a summary IP address on a RIPv2 interface. Use the **no** variant of this command to remove a summary IP address from a selected RIPv2 interface.

Syntax `ip summary-address rip {<ip-address/prefix-length>}`
`no ip summary-address rip {<ip-address/prefix-length>}`

Parameter	Description
<code><ip-address/prefix-length></code>	The summary IPv4 address to be advertised

Mode Interface Configuration for a VLAN interface.

Usage notes Route summarization is a technique that helps network administrators reduce the size of the routing tables by advertising a single super-network that covers a range of subnets.

You statically configure an IP summary address on a router interface. The router then advertises the summary address downstream through this interface. This means that:

- all the routers that are downstream from the configured interface will receive only the summary route, and none of the child routes via the RIP advertisement.
- As long as at least one of the child routes is valid, the router will propagate the summary route. But when the last child that is part of the summarized range disappears, then the router will stop advertising the summary route through the interface.

This command will be rejected if there is no IP address configured on the interface.

NOTE: *Manual route summarization is not supported when the interface/router is running in RIPv1.*

Example The subnets 10.4.1.0/24, 10.4.2.128/25 and 10.4.3.0/24 can be summarized and advertised as 10.4.0.0/16 on vlan1 using the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip summary-address rip 10.4.0.0/16
```

Related commands [show ip rip database](#)
[show ip protocols rip](#)

Command changes Version 5.4.8-0.2 command added

ip prefix-list

Overview Use this command to create an entry for an IPv4 prefix list.

Use the **no** variant of this command to delete the IPv4 prefix-list entry.

Syntax `ip prefix-list <list-name> [seq <1-429496725>] {deny|permit} {any|<ip-prefix>} [ge <0-32>] [le <0-32>]`
`ip prefix-list <list-name> description <text>`
`ip prefix-list sequence-number`
`no ip prefix-list <list-name> [seq <1-429496725>]`
`no ip prefix-list <list-name> [description <text>]`
`no ip prefix-list sequence-number`

Parameter	Description
<list-name>	Specifies the name of a prefix list.
seq <1-429496725>	Sequence number of the prefix list entry.
deny	Specifies that the prefixes are excluded from the list.
permit	Specifies that the prefixes are included in the list.
<ip-prefix>	Specifies the IPv4 address and length of the network mask in dotted decimal in the format A.B.C.D/M.
any	Any prefix match. Same as 0.0.0.0/0 le 32 .
ge<0-32>	Specifies the minimum prefix length to be matched.
le<0-32>	Specifies the maximum prefix length to be matched.
<text>	Text description of the prefix list.
sequence-number	Specify sequence numbers included or excluded in prefix list.

Mode Global Configuration

Usage notes When the device processes a prefix list, it starts to match prefixes from the top of the prefix list, and stops whenever a permit or deny occurs. To promote efficiency, use the **seq** parameter and place common permits or denials towards the top of the list. If you do not use the **seq** parameter, the sequence values are generated in a sequence of 5.

The parameters **ge** and **le** specify the range of the prefix lengths to be matched. When setting these parameters, set the **le** value to be less than 32, and the **ge** value to be less than or equal to the **le** value and greater than the ip-prefix mask length.

Prefix lists implicitly exclude prefixes that are not explicitly permitted in the prefix list. This means if a prefix that is being checked against the prefix list reaches the end of the prefix list without matching a permit or deny, this prefix will be denied.

Example To deny the IP addresses between 10.0.0.0/14 (10.0.0.0 255.252.0.0) and 10.0.0.0/22 (10.0.0.0 255.255.252.0) within the 10.0.0.0/8 (10.0.0.0 255.0.0.0) addressing range, enter the following commands:

```
awplus# configure terminal
awplus(config)# ip prefix-list mylist seq 12345 deny 10.0.0.0/8
ge 14 le 22
```

Related commands

- match ip address**
- area filter-list**
- clear ip prefix-list**
- match route-type**
- show ip prefix-list**

ip rip authentication key-chain

Overview Use this command to enable RIPv2 authentication on an interface and specify the name of the key chain to be used.

Use the **no** variant of this command to disable this function.

Syntax ip rip authentication key-chain <key-chain-name>
no ip rip authentication key-chain

Parameter	Description
<key-chain-name>	Specify the name of the key chain. This is an alphanumeric string, but it cannot include spaces.

Mode Interface Configuration for a VLAN interface.

Usage notes Use this command to perform authentication on the interface. Not configuring the key chain results in no authentication at all.

The AlliedWare Plus™ implementation provides the choice of configuring authentication for single key or multiple keys at different times. Use the **ip rip authentication string** command for single key authentication. Use the **ip rip authentication key-chain** command for multiple keys authentication. See the **RIP Feature Overview and Configuration Guide** for illustrated RIP configuration examples.

For multiple key authentication, use the following steps to configure a route to enable RIPv2 authentication using multiple keys at different times:

1. Define a key chain with a key chain name, using the following commands:

```
awplus# configure terminal
awplus(config)# key chain <key-chain-name>
```

2. Define a key on this key chain, using the following command:

```
awplus(config-keychain)# key <keyid>
```

3. Define the password used by the key, using the following command:

```
awplus(config-keychain-key)# key-string <key-password>
```

4. Enable authentication on the desired interface and specify the key chain to be used, using the following commands:

```
awplus# configure terminal
awplus(config)# interface <id>
awplus(config-if)# ip rip authentication key-chain <key-chain-name>
```

5. Specify the mode of authentication for the given interface (text or MD5), using the following command:

```
awplus(config-if)# ip rip authentication mode {md5|text}
```


Example 1 To use the key chain named 'mykey' on the interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip authentication key-chain mykey
```

Example 2 In the following example of a configuration for multiple keys authentication, a password 'toyota' is set for key 1 in key chain 'cars'. Authentication is enabled on vlan2 and the authentication mode is set to MD5:

```
awplus# configure terminal
awplus(config)# key chain cars
awplus(config-keychain)# key 1
awplus(config-keychain-key)# key-string toyota
awplus(config-keychain-key)# accept-lifetime 10:00:00 Oct 08
2021 duration 43200
awplus(config-keychain-key)# send-lifetime 10:00:00 Oct 08 2021
duration 43200
awplus(config-keychain-key)# exit
awplus(config-keychain)# exit
awplus(config)# interface vlan2
awplus(config-if)# ip rip authentication key-chain cars
awplus(config-if)# ip rip authentication mode md5
```

Related commands

- accept-lifetime**
- send-lifetime**
- ip rip authentication mode**
- ip rip authentication string**
- key**
- key chain**

ip rip authentication mode

Overview Use this command to specify the type of authentication mode used for RIP v2 packets.

Use the **no** variant of this command to restore clear text authentication.

Syntax ip rip authentication mode {md5|text}
no ip rip authentication mode

Parameter	Description
md5	Uses the keyed MD5 authentication algorithm.
text	Specifies clear text or simple password authentication.

Default Text authentication is enabled

Mode Interface Configuration for a VLAN interface.

Usage notes The AlliedWare Plus™ implementation provides the choice of configuring authentication for single key or multiple keys at different times. Use the **ip rip authentication string** command for single key authentication. Use the **ip rip authentication key-chain** command for multiple keys authentication. See the **RIP Feature Overview and Configuration Guide** for illustrated RIP configuration examples.

Usage: single key Use the following steps to configure a route to enable RIPv2 authentication using a single key or password:

1. Define the authentication string or password used by the key for the desired interface, using the following commands:

```
awplus# configure terminal
awplus(config)# interface <id>
awplus(config-if)# ip rip authentication string <auth-string>
```

2. Specify the mode of authentication for the given interface (text or MD5), using the following commands:

```
awplus# configure terminal
awplus(config)# interface <id>
awplus(config-if)# ip rip authentication mode {md5|text}
```

Usage: For multiple keys authentication, use the following steps to configure a route to enable RIPv2 authentication using multiple keys at different times:

multiple key

1. Define a key chain with a key chain name, using the following commands:

```
awplus# configure terminal
```

```
awplus(config)# key chain <key-chain-name>
```

2. Define a key on this key chain using the following command:

```
awplus(config-keychain)# key <keyid>
```

3. Define the password used by the key, using the following command:

```
awplus(config-keychain-key)# key-string <key-password>
```

4. Enable authentication on the desired interface and specify the key chain to be used, using the following commands:

```
awplus(config-if)# ip rip authentication key-chain <key-chain-name>
```

5. Specify the mode of authentication for the given interface (text or MD5), using the following commands:

```
awplus(config-if)# ip rip authentication mode {md5|text}
```

Example 1 To use MD5 authentication on the interface vlan2, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# interface vlan2
```

```
awplus(config-if)# ip rip authentication mode md5
```

Example 2 In the following example of a configuration for multiple keys authentication, a password 'toyota' is set for key 1 in key chain 'cars'. Authentication is enabled on vlan2 and the authentication mode is set to MD5:

```
awplus# configure terminal
```

```
awplus(config)# key chain cars
```

```
awplus(config-keychain)# key 1
```

```
awplus(config-keychain-key)# key-string toyota
```

```
awplus(config-keychain-key)# accept-lifetime 10:00:00 Oct 08 2016 duration 43200
```

```
awplus(config-keychain-key)# send-lifetime 10:00:00 Oct 08 2016 duration 43200
```

```
awplus(config-keychain-key)# exit
```

```
awplus(config-keychain)# exit
```

```
awplus(config)# interface vlan2
```

```
awplus(config-if)# ip rip authentication key-chain cars
```

```
awplus(config-if)# ip rip authentication mode md5
```

Related commands [ip rip authentication string](#)
[ip rip authentication key-chain](#)

ip rip authentication string

Overview Use this command to specify the authentication string or password used by a key.

Use the **no** variant of this command to remove the authentication string.

Syntax `ip rip authentication string [encrypted] <auth-string>`
`no ip rip authentication string`

Parameter	Description
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
<auth-string>	The authentication string or password used by a key. It is an alpha- numeric string and can include spaces.

Mode Interface Configuration for a VLAN interface.

Usage notes The AlliedWare Plus™ implementation provides the choice of configuring authentication for single key or multiple keys at different times. Use this command to specify the password for a single key on an interface. Use the **ip rip authentication key-chain** command for multiple keys authentication. For information about configuring RIP, see the **RIP Feature Overview and Configuration Guide**.

Use the following steps to configure a route to enable RIPv2 authentication using a single key or password:

1. Define the authentication string or password used by the key for the desired interface, using the following commands:

```
awplus# configure terminal
```

```
awplus(config)# interface <id>
```

2. Specify the mode of authentication for the given interface (text or MD5), using the following commands:

```
awplus# configure terminal
```

```
awplus(config-if)# ip rip authentication string <auth-string>
```

```
awplus(config)# interface <id>
```

```
awplus(config-if)# ip rip authentication mode {md5|text}
```

Example To specify 'mykey' as the authentication string and use MD5 authentication for the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip authentication string mykey
awplus(config-if)# ip rip authentication mode md5
```

Any RIP packet received on that interface should have the same string as its password.

Related commands [ip rip authentication key-chain](#)
[ip rip authentication mode](#)

Command changes Version 5.5.4-0.1: **encrypted** parameter added

ip rip receive-packet

Overview Use this command to configure the interface to enable the reception of RIP packets.

Use the **no** variant of this command to disable this feature.

Syntax ip rip receive-packet
no ip rip receive-packet

Default Enabled

Mode Interface Configuration for a VLAN interface.

Example To turn on packet receiving on the interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip receive-packet
```

Related commands [ip rip send-packet](#)

ip rip receive version

Overview Use this command to specify the version of RIP packets accepted on an interface and override the setting of the version command.

Use the **no** variant of this command to use the setting specified by the **version (RIP)**.

Syntax ip rip receive version [1] [2]
no ip rip receive version

Parameter	Description
1	Specifies acceptance of RIP version 1 packets on the interface.
2	Specifies acceptance of RIP version 2 packets on the interface.

Default Version 2

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to a specific interface and overrides the version specified by the **version (RIP)** command.

RIP can be run in version 1 or version 2 mode. Version 2 has more features than version 1; in particular RIP version 2 supports authentication and classless routing. Once the RIP version is set, RIP packets of that version will be received and sent on all the RIP-enabled interfaces.

Example To set the interface vlan2 to receive both RIP version 1 and 2 packets, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip receive version 1 2
```

Related commands **version (RIP)**

ip rip send-packet

Overview Use this command to enable sending RIP packets through the current interface.

Use the **no** variant of this command to disable this feature.

Syntax ip rip send-packet
no ip rip send-packet

Default Enabled

Mode Interface Configuration for a VLAN interface.

Example To turn on packet sending on the interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip send-packet
```

Related commands [ip rip receive-packet](#)

ip rip send version

Overview Use this command in Interface Configuration mode to specify the version of RIP packets sent on an interface and override the setting of the **version (RIP)** command. This mechanism causes RIP version 2 interfaces to send multicast packets instead of broadcasting packets.

Use the **no** variant of this command to use the setting specified by the **version (RIP)** command.

Syntax ip rip send version {1|2|1 2|2 1}
no ip rip send version

Parameter	Description
1	Specifies the sending of RIP version 1 packets out of an interface.
2	Specifies the sending of RIP version 2 packets out of an interface.
1 2	Specifies the sending of both RIP version 1 and RIP version 2 packets out of an interface.
2 1	Specifies the sending of both RIP version 2 and RIP version 1 packets out of an interface.

Default Version 2

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to a specific interface and overrides the version specified by the **version (RIP)** command.

RIP can be run in version 1 or version 2 mode. Version 2 has more features than version 1; in particular RIP version 2 supports authentication and classless routing. Once the RIP version is set, RIP packets of that version will be received and sent on all the RIP-enabled interfaces. Selecting version parameters 1 2 or 2 1 sends RIP version 1 and 2 packets.

Use the **ip rip send version 1-compatible** command in an environment where you cannot send multicast packets. For example, in environments where multicast is not enabled and where hosts do not listen to multicast.

Examples To set the interface vlan2 to send both RIP version 1 and 2 packets, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip send version 1 2
```

Related commands [ip rip send version 1-compatible version \(RIP\)](#)

ip rip send version 1-compatible

Overview Use this command in Interface Configuration mode to send RIP version 1 compatible packets from a RIP version 2 interface to other RIP Interfaces. This mechanism causes RIP version 2 interfaces to send broadcast packets instead of multicasting packets, and is used in environments where multicast is not enabled or where hosts do not listen to multicast.

Use the **no** variant of this command to use the setting specified by the **version (RIP)** command, and disable the broadcast of RIP version 2 packets that are sent as broadcast packets.

Syntax ip rip send version 1-compatible
no ip rip send version

Parameter	Description
1-compatible	Specify this parameter to send RIP version 1 compatible packets from a version 2 RIP interface to other RIP interfaces. This mechanism causes version 2 RIP interfaces to broadcast packets instead of multicasting packets.

Default RIP version 2 is enabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to a specific interface and overrides the version specified by the **version (RIP)** command.

RIP can be run in version 1 compatible mode. Version 2 has more features than version 1; in particular RIP version 2 supports authentication and classless routing. Once the RIP version is set, RIP packets of that version will be received and sent on all the RIP-enabled interfaces.

Use the **ip rip send version** command in an environment where you can send multicast packets, for example, in environments where multicast is enabled and where hosts listen to multicast.

Example To set the interface vlan2 to send RIP version 1- compatible packets, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip send version 1-compatible
```

Related commands [ip rip send version](#)
[version \(RIP\)](#)

ip rip split-horizon

Overview Use this command to turn on the split-horizon mechanism on the interface.

Use the **no** variant of this command to disable this mechanism.

Syntax ip rip split-horizon [poisoned]
no ip rip split-horizon

Parameter	Description
poisoned	Performs split-horizon with poison-reverse. See "Usage" below for more information.

Default Split horizon poisoned

Mode Interface Configuration for a VLAN interface.

Usage notes Use this command to avoid including routes in updates sent to the same gateway from which they were learned. Without the **poisoned** parameter, using this command causes routes learned from a neighbor to be omitted from updates sent to that neighbor. With the **poisoned** parameter, using this command causes such routes to be included in updates, but sets their metrics to infinity. This advertises that these routes are not reachable.

Example To turn on split horizon poisoned on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip rip split-horizon poisoned
```

key

Overview Use this command to manage, add and delete authentication keys in a key-chain.

Use the **no** variant of this command to delete the authentication key.

Syntax key <keyid>
no key <keyid>

Parameter	Description
<keyid>	<0-2147483647> Key identifier number.

Mode Keychain Configuration

Usage This command allows you to enter the keychain-key mode where a password can be set for the key.

Example The following example configures a key number 1 and shows the change into a **keychain- key** command mode prompt.

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)#
```

Related commands **key chain**
key-string
accept-lifetime
send-lifetime

key chain

Overview Use this command to enter the key chain management mode and to configure a key chain with a key chain name.

Use the **no** variant of this command to remove the key chain and all configured keys.

Syntax `key chain <key-chain-name>`
`no key chain <key-chain-name>`

Parameter	Description
<code><key-chain-name></code>	Specify the name of the key chain to manage.

Mode Global Configuration

Usage This command allows you to enter the keychain mode from which you can specify keys on this key chain.

Example The following example shows the creation of a key chain named mychain and the change into **keychain** mode prompt.

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)#
```

Related commands [key](#)
[key-string](#)
[accept-lifetime](#)
[send-lifetime](#)

key-string

Overview Use this command to define the password to be used by a key.
Use the **no** variant of this command to remove a password.

Syntax key-string [encrypted] <key-password>
no key-string

Parameter	Description
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
<key-password>	A string of characters to be used as a password by the key.

Mode Keychain-key Configuration

Usage Use this command to specify passwords for different keys.

Examples To set the password for 'key1' in the key chain named 'mychain' to 'VerySecret', use the commands:

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)# key-string VerySecret
```

To remove the password for 'key1' in the key chain named 'mychain':

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)# no key-string
```

Related commands [key](#)
[key chain](#)
[accept-lifetime](#)
[send-lifetime](#)

Command changes Version 5.5.4-0.1: **encrypted** parameter added

maximum-prefix

Overview Use this command to configure the maximum number of RIP routes stored by the device.

Use the **no** variant of this command to disable all limiting of the number of RIP routes stored by the device.

Syntax `maximum-prefix <maxprefix> [<threshold>]`
`no maximum-prefix`

Parameter	Description
<code><maxprefix></code>	<code><1-65535></code> The maximum number of RIP routes allowed.
<code><threshold></code>	<code><1-100></code> Percentage of maximum routes to generate a warning. The default threshold is 75%.

Mode Router Configuration

Example To configure the maximum number of RIP routes to 150, use the following command:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# maximum-prefix 150
```

neighbor (RIP)

Overview Use this command to specify a neighbor router. It is used for each router to which you wish to send unicast RIP updates.

Use the **no** variant of this command to stop sending unicast updates to the specific router.

Syntax neighbor <ip-address>
no neighbor <ip-address>

Parameter	Description
<ip-address>	The IP address of a neighboring router with which the routing information will be exchanged.

Default Disabled

Mode Router Configuration

Usage Use this command to exchange nonbroadcast routing information. It can be used multiple times for additional neighbors.

The **passive-interface (RIP)** command disables sending routing updates on an interface. If you want to send routing updates only to specific neighbors, use the **passive-interface (RIP)** command and this **neighbor** command together.

Example To specify the neighbor router to 1.1.1.1, use the following command:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# passive-interface vlan1
awplus(config-router)# neighbor 1.1.1.1
```

Related commands **passive-interface (RIP)**

network (RIP)

Overview Use this command to activate the transmission of RIP routing information on the defined network.

Use the **no** variant of this command to remove the specified network or interface as one that runs RIP.

Syntax `network {<network-address>[/<subnet-mask>]|<interface>}`
`no network {<network-address>[/<subnet-mask>]|<interface>}`

Parameter	Description
<code><network-address>[/<subnet-mask>]</code>	Specifies the network address to run RIP. Entering a subnet mask (or prefix length) for the network address is optional. Where no mask is entered, the device will attempt to apply a mask that is appropriate to the class (A, B, or C) of the address entered, e.g. an IP address of 10.0.0.0 will have a prefix length of 8 applied to it.
<code><interface></code>	Specify an interface to run RIP.

Default Disabled

Mode RIP Router Configuration

Usage notes Use this command to specify networks, by IP address or interface, to which routing updates will be sent and received. The connected routes corresponding to the specified network will be automatically advertised in RIP updates. RIP updates will be sent and received within the specified network.

Example Use the following commands to activate RIP routing updates on network 172.16.20.0/24:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# network 172.16.20.0/24
```

Related commands [show ip rip](#)
[show running-config](#)
[clear ip rip route](#)

offset-list (RIP)

Overview Use this command to add an offset to the **in** and **out** metrics of routes learned through RIP.

Use the **no** variant of this command to remove the offset list.

Syntax `offset-list <access-list> {in|out} <offset> [<interface>]`
`no offset-list <access-list> {in|out} <offset> [<interface>]`

Parameter	Description
<code><access-list></code>	Specifies the access-list number or names to apply. Note that you can only use standard ACLs, not extended ACLs.
<code>in</code>	Indicates the access list will be used for metrics of incoming advertised routes.
<code>out</code>	Indicates the access list will be used for metrics of outgoing advertised routes.
<code><offset></code>	<code><0-16></code> Specifies that the offset is used for metrics of networks matching the access list.
<code><interface></code>	An alphanumeric string that specifies the interface to match.

Default The default offset value is the metric value of the interface over which the updates are being exchanged.

Mode RIP Router Configuration

Usage Use this command to specify the offset value that is added to the routing metric. When the networks match the access list the offset is applied to the metrics. No change occurs if the offset value is zero.

Examples In this example the router examines the RIP updates being sent out from interface vlan2 and adds 5 hops to the routes matching the IP addresses specified in the access list 8. To do this, use these commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# offset-list 8 in 5 vlan2
```

Related commands [access-list \(extended numbered\)](#)

passive-interface (RIP)

Overview Use this command to block RIP broadcasts on the interface.
Use the **no** variant of this command to disable this function.

Syntax `passive-interface <interface>`
`no passive-interface <interface>`

Parameter	Description
<code><interface></code>	Specifies the interface name.

Default Disabled

Mode RIP Router Configuration

Example Use the following commands to block RIP broadcasts on vlan2:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# passive-interface vlan2
```

Related commands [show ip rip](#)

recv-buffer-size (RIP)

Overview Use this command to run-time configure the RIP UDP (User Datagram Protocol) receive-buffer size to improve UDP reliability by avoiding UDP receive buffer overrun.

Use the **no** variant of this command to reset the configured RIP UDP receive-buffer size to the system default (196608 bits).

Syntax `recv-buffer-size <8192-2147483647>`
`no recv-buffer-size [<8192-2147483647>]`

Parameter	Description
<code><8192-2147483647></code>	Specify the RIP UDP (User Datagram Protocol) buffer size value in bits.

Default 196608 bits is the system default when reset using the **no** variant of this command.

Mode Router Configuration

Examples To run-time configure the RIP UDP, use the following commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# recv-buffer-size 23456789
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# no recv-buffer-size 23456789
```

redistribute (RIP)

Overview Use this command to redistribute information from other routing protocols into RIP.

Use the **no** variant of this command to disable the specified redistribution. The parameters **metric** and **route-map** may be used with the **no** variant, but have no effect.

Syntax `redistribute {connected|static|ospf} [metric <0-16>] [route-map <route-map>]`
`no redistribute {connected|static|ospf} [metric] [route-map]`

Parameter	Description
route-map	Optional. Specifies route-map that controls how routes are redistributed.
<route-map>	Optional. The name of the route map.
connected	Redistribute from connected routes.
static	Redistribute from static routes.
ospf	Redistribute from Open Shortest Path First (OSPF).
metric <0-16>	Optional. Sets the value of the metric that will be applied to routes redistributed into RIP from other protocols. If a value is not specified, and no value is specified using the default-metric (RIP) command, the default is one.

Default By default, the RIP metric value is set to 1.

Mode RIP Router Configuration

Example To apply the metric value 15 to static routes being redistributed into RIP, use the commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# redistribute static metric 15
```

Related commands **default-metric (RIP)**

restart rip graceful

Overview Use this command to force the RIP process to restart, and optionally set the grace-period.

Syntax restart rip graceful [grace-period <1-65535>]

Mode Privileged Exec

Default The default RIP grace-period is 60 seconds.

Usage notes After this command is executed, the RIP process immediately shuts down. It notifies the system that RIP has performed a graceful shutdown. Routes that have been installed into the route table by RIP are preserved until the specified grace-period expires.

When a **restart rip graceful** command is issued, the RIP configuration is reloaded from the last saved configuration. Ensure you first enter the command **copy running-config startup-config**.

Example To apply a restart rip graceful setting, grace-period to 100 seconds use the following commands:

```
awplus# copy running-config startup-config
awplus# restart rip graceful grace-period 100
```


rip restart grace-period

Overview Use this command to change the grace period of RIP graceful restart.
Use the **no** variant of this command to disable this function.

Syntax rip restart grace-period <1-65535>
no rip restart grace-period <1-65535>

Mode Global Configuration

Default The default RIP grace-period is 60 seconds.

Usage notes Use this command to enable the **Graceful Restart** feature on the RIP process. Entering this command configures a grace period for RIP.

Example awplus# configure terminal
awplus(config)# rip restart grace-period 200

route (RIP)

Overview Use this command to add a static RIP route.
Use the **no** variant of this command to remove a static RIP route.

Syntax route <ip-addr/prefix-length>
no route <ip-addr/prefix-length>

Parameter	Description
<ip-addr/prefix-length>	The IPv4 address and prefix length.

Default No static RIP route is added by default.

Mode RIP Router Configuration

Usage notes Use this command to add a static RIP route. After adding the RIP route, the route can be checked in the RIP routing table.

Example To create a static RIP route to IP subnet 192.168.1.0/24, use the following commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# route 192.168.1.0/24
```

Related commands [show ip rip](#)
[clear ip rip route](#)

router rip

Overview Use this global command to enter Router Configuration mode to enable the RIP routing process.

Use the **no** variant of this command to disable the RIP routing process.

Syntax router rip
no router rip

Mode Global Configuration

Example This command is used to begin the RIP routing process:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# version 1
awplus(config-router)# network 10.10.10.0/24
awplus(config-router)# network 10.10.11.0/24
awplus(config-router)# neighbor 10.10.10.10
```

Related commands [network \(RIP\)](#)
[version \(RIP\)](#)

send-lifetime

Overview Use this command to specify the time period during which the authentication key on a key chain can be sent.

Syntax send-lifetime <start-date> {<end-date>|
duration <seconds>|infinite}
no send-lifetime

Parameter	Description
<start-date>	Specifies the start time and date in the format: <hh:mm:ss> <day> <month> <year> or <hh:mm:ss> <month> <day> <year>, where:
	<hh:mm:ss> The time of the day, in hours, minutes and seconds
	<day> <1-31> The day of the month
	<month> The month of the year (the first three letters of the month, for example, Jan)
	<year> <1993-2035> The year
<end-date>	Specifies the end time and date in the format: <hh:mm:ss> <day> <month> <year> or <hh:mm:ss> <month> <day> <year>, where:
	<hh:mm:ss> The time of the day, in hours, minutes and seconds
	<day> <1-31> The day of the month
	<month> The month of the year (the first three letters of the month, for example, Jan)
	<year> <1993-2035> The year
<seconds>	<1-2147483646> Duration of the key in seconds.
infinite	Never expires.

Mode Keychain-key Configuration

Example The following example shows the setting of send-lifetime for key 1 on the key chain named "mychain".

```
awplus# configure terminal
awplus(config)# key chain mychain
awplus(config-keychain)# key 1
awplus(config-keychain-key)# send-lifetime 03:03:01 Jan 3 2016
04:04:02 Dec 6 2016
```

Related commands

- [key](#)
- [key-string](#)
- [key chain](#)
- [accept-lifetime](#)

service rip

Overview Use this command to enable the RIP service.

Use the **no** version of the command to disable the RIP service if you are not using it.

Syntax service rip
no service rip

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using RIP. Enable it before configuring RIP.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the RIP service, use the commands:

```
awplus# configure terminal
awplus(config)# service rip
```

To disable the RIP service, use the commands:

```
awplus# configure terminal
awplus(config)# no service rip
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show debugging rip

Overview Use this command to display the RIP debugging status for these debugging options: nsm debugging, RIP event debugging, RIP packet debugging and RIP nsm debugging.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging rip

Mode User Exec and Privileged Exec

Usage notes Use this command to display the debug status of RIP.

Example awplus# show debugging rip

show ip prefix-list

Overview Use this command to display the IPv4 prefix-list entries.

Note that this command is valid for RIP only.

Syntax `show ip prefix-list [<name>|detail|summary]`

Parameter	Description
<name>	Specify the name of a prefix list in this placeholder.
detail	Specify this parameter to show detailed output for all IPv4 prefix lists.
summary	Specify this parameter to show summary output for all IPv4 prefix lists.

Mode User Exec and Privileged Exec

Example `awplus# show ip prefix-list`
`awplus# show ip prefix-list 10.10.0.98/8`
`awplus# show ip prefix-list detail`

Related commands [ip prefix-list](#)

show ip protocols rip

Overview Use this command to display RIP process parameters and statistics.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip protocols rip

Mode User Exec and Privileged Exec

Example awplus# show ip protocols rip

Output The following shows typical output.

Example output from the show ip protocols rip command

```
Routing Protocol is "rip"
Sending updates every 30 seconds with +/-50%, next due in 12
seconds
Timeout after 180 seconds, garbage collect after 120 seconds
Outgoing update filter list for all interface is not set
Incoming update filter list for all interface is not set
Default redistribution metric is 1
Redistributing: connected static
Default version control: send version 2, receive version 2
Interface          Send Recv  Key-chain
  vlan25             2      2
Routing for Networks:
  10.10.0.0/24
Routing Information Sources:
  Gateway            BadPackets BadRoutes  Distance Last Update
Distance: (default is 120)
```

show ip rip

Overview Use this command to show RIP routes.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip rip

Mode User Exec and Privileged Exec

Example awplus# show ip rip

Output The following shows typical output.

Example output from the show ip rip command

```
awplus#show ip rip
Codes: R - RIP, Rc - RIP connected, Rs - RIP static
       C - Connected, S - Static, O - OSPF, B - BGP
Network      Next Hop Metric From If    Time
C 10.0.1.0/24      1      vlan20
S 10.10.10.0/24    1      vlan20
C 10.10.11.0/24    1      vlan20
S 192.168.101.0/24 1      vlan20
R 192.192.192.0/24 1      --
```

Related commands **[route \(RIP\)](#)**
[network \(RIP\)](#)
[clear ip rip route](#)

show ip rip database

Overview Use this command to display information about the RIP database.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip rip database [full]

Parameter	Description
full	Specify the full RIP database including sub-optimal RIP routes.

Mode User Exec and Privileged Exec

Example awplus# show ip rip database
awplus# show ip rip database full

Related commands [show ip rip](#)

show ip rip interface

Overview Use this command to display information about the RIP interfaces. You can specify an interface name to display information about a specific interface.

Syntax show ip rip interface [<interface>]

Parameter	Description
<interface>	The interface to display information about.

Mode User Exec and Privileged Exec

Example awplus# show ip rip interface

timers (RIP)

Overview Use this command to adjust routing network timers.

Use the **no** variant of this command to restore the defaults.

Syntax `timers basic <update> <timeout> <garbage>`
`no timers basic`

Parameter	Description
<code><update></code>	<code><5-2147483647></code> Specifies the period at which RIP route update packets are transmitted. The default is 30 seconds.
<code><timeout></code>	<code><5-2147483647></code> Specifies the routing information timeout timer in seconds. The default is 180 seconds. After this interval has elapsed and no updates for a route are received, the route is declared invalid.
<code><garbage></code>	<code><5-2147483647></code> Specifies the routing garbage collection timer in seconds. The default is 120 seconds.

Default Enabled

Mode RIP Router Configuration

Usage notes This command adjusts the RIP timing parameters.

The update timer is the time between sending out updates, that contain the complete routing table, to every neighboring router.

If an update for a given route has not been seen for the time specified by the timeout parameter, that route is no longer valid. However, it is retained in the routing table for a short time, with metric 16, so that neighbors are notified that the route has been dropped.

When the time specified by the garbage parameter expires the metric 16 route is finally removed from the routing table. Until the garbage time expires, the route is included in all updates sent by the router.

All the routers in the network must have the same timers to ensure the smooth operation of RIP throughout the network.

Examples To set the update timer to 30, the routing information timeout timer to 180, and the routing garbage collection timer to 120, use the following command:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# timers basic 30 180 120
```

undebg rip

Overview Use this command to disable the options set for debugging information of RIP events, packets and communication between RIP and NSM.

This command has the same effect as the **no debug rip** command.

Syntax undebg rip {all|events|nsm|<packet>}

Parameter	Description
all	Disables all RIP debugging.
events	Disables the logging of RIP events.
nsm	Disables the logging of RIP and NSM communication.
<packet>	packet [recv|send] [detail] Disables the debugging of RIP packets.
recv	Disables the logging of received packet information.
send	Disables the logging of sent packet information.
detail	Disables the logging of sent or received RIP packets.

Mode Privileged Exec

Example To disable the options set for debugging RIP information events, use the following command:

```
awplus# undebg rip packet
```

Related commands [debug rip](#)

version (RIP)

Overview Use this command to specify a RIP version used globally by the router.
Use the **no** variant of this command to restore the default version.

Syntax `version {1|2}`
`no version`

Parameter	Description
1|2	Specifies the version of RIP processing.

Default Version 2

Mode RIP Router Configuration

Usage notes RIP can be run in version 1 or version 2 mode. Version 2 has more features than version 1; in particular RIP version 2 supports authentication and classless routing. Once the RIP version is set, RIP packets of that version will be received and sent on all the RIP-enabled interfaces.

Setting the version command has no impact on receiving updates, only on sending them. The **ip rip send version** command overrides the value set by the **version (RIP)** command on an interface-specific basis. The **ip rip receive version** command allows you to configure a specific interface to accept only packets of the specified RIP version. The **ip rip receive version** command and the **ip rip send version** command override the value set by this command.

Examples To specify a RIP version, use the following commands:

```
awplus# configure terminal
awplus(config)# router rip
awplus(config-router)# version 1
```

Related commands **ip rip receive version**
ip rip send version
show running-config

25 RIPng for IPv6 Commands

- Contents**
- **Introduction** on page 1126
 - **aggregate-address (IPv6 RIPng)** on page 1127
 - **clear ipv6 rip route** on page 1128
 - **debug ipv6 rip** on page 1129
 - **default-information originate (IPv6 RIPng)** on page 1130
 - **default-metric (IPv6 RIPng)** on page 1131
 - **distribute-list (IPv6 RIPng)** on page 1132
 - **ipv6 prefix-list** on page 1133
 - **ipv6 rip metric-offset** on page 1135
 - **ipv6 rip split-horizon** on page 1137
 - **ipv6 router rip** on page 1138
 - **neighbor (IPv6 RIPng)** on page 1139
 - **offset-list (IPv6 RIPng)** on page 1140
 - **passive-interface (IPv6 RIPng)** on page 1141
 - **recv-buffer-size (IPv6 RIPng)** on page 1142
 - **redistribute (IPv6 RIPng)** on page 1143
 - **route (IPv6 RIPng)** on page 1144
 - **router ipv6 rip** on page 1145
 - **service ripng** on page 1146
 - **show debugging ipv6 rip** on page 1147
 - **show ipv6 prefix-list** on page 1148
 - **show ipv6 protocols rip** on page 1149
 - **show ipv6 rip** on page 1150
 - **show ipv6 rip database** on page 1151
 - **show ipv6 rip interface** on page 1152
 - **timers (IPv6 RIPng)** on page 1153
 - **undebug ipv6 rip** on page 1154

Introduction

Overview This chapter contains RIPng commands. RIPng (Routing Information Protocol next generation) is an extension of RIPv2 to support IPv6. RFC 2080 specifies RIPng. The differences between RIPv2 and RIPng are:

- RIPng does not support RIP updates authentication
- RIPng does not allow the attachment of arbitrary tags to routes
- RIPng requires the encoding of the next-hop for a set of routes

For more information, see the [RIPng Feature Overview and Configuration Guide](#).

aggregate-address (IPv6 RIPng)

Overview Use this command to add an aggregate route to RIPng.

Use the **no** variant of this command to remove the aggregate route from RIPng.

Syntax aggregate-address <ipv6-addr/prefix-length>
no aggregate-address <ipv6-addr/prefix-length>

Parameter	Description
<ipv6-addr/prefix-length>	Specify the IPv6 Address in the format X:X::X:X/ Prefix-Length. The prefix-length is a decimal integer between 1 and 128.

Mode Router Configuration

Usage notes The route will not be added to the RIPng database unless the database contains at least one route which is contained within the address range covered by the aggregate route. As soon as there are any such component routes in the RIPng database, then the following occurs:

- the aggregate route is added to the RIPng database
- all the component routes that are within the address range covered by the aggregate route are retained in the RIPng database, but are marked as suppressed routes. The aggregate route will be advertised in RIPng updates, and the component route will no longer be advertised.

Note that simply having a component route in the IPv6 route database is not a sufficient condition for the aggregate route to be included into the RIPng database. The component route(s) must be in the RIPng database before the aggregate route will be included in the RIPng database. There is no restriction on the method by which the component routes have arrived into the RIPng database, it can be by being connected RIP interfaces, by redistribution or by direct inclusion using the **route** command in router IPv6 RIP configuration mode.

Example awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# aggregate-address 2001:db8::/32

clear ipv6 rip route

Overview Use this command to clear specific data from the RIPng routing table.

Syntax `clear ipv6 rip route {<ipv6-addr/prefix-length>|all|connected|rip|static|ospf}`

Parameter	Description
<i><ipv6-addr/prefix-length></i>	Specify the IPv6 Address in format <i>X:X::X:X/Prefix-Length</i> . The prefix-length is a decimal integer between 1 and 128. Removes entries which exactly match this destination address from the RIPng routing table.
connected	Removes redistributed connected entries from RIPng routing table.
static	Removes redistributed static entries from the RIPng routing table.
rip	Removes RIPng routes from the RIPng routing table.
ospf	Removes redistributed OSPFv3 routes from the RIPng routing table.
all	Clears the entire RIPng routing table.

Mode Privileged Exec

Example `awplus# clear ipv6 rip route all`
`awplus# clear ipv6 rip route 2001:db8::/32`

debug ipv6 rip

Overview Use this command to enable RIPng debugging and specify debugging for RIPng events, RIPng packets, or RIPng communication with NSM processes.

Use the **no** variant of this command to disable RIPng debugging.

Syntax `debug ipv6 rip [all|events|nsm|packet [detail]]|recv [detail]|send [detail]`
`no debug ipv6 rip [all|events|nsm|packet [detail]]|recv [detail]|send [detail]`

Parameter	Description
all	Displays all RIPng debugging showing RIPng events debug information, RIPng received packets information, and RIPng sent packets information.
events	Displays RIPng events debug information.
nsm	Displays RIPng and NSM communication.
packet	Displays RIPng packets only.
recv	Displays information for received packets.
send	Displays information for sent packets.
detail	Displays detailed information for the sent or received packet.

Default RIPng debugging is disabled by default.

Mode Privileged Exec and Global Configuration

Example `awplus# debug ipv6 rip events`
`awplus# debug ipv6 rip packet send detail`
`awplus# debug ipv6 rip nsm`

Related commands [undebug ipv6 rip](#)

default-information originate (IPv6 RIPng)

Overview Use this command to generate a default route into RIPng.
Use the **no** variant of this command to disable this feature.

Syntax default-information originate
no default-information originate

Default Disabled

Mode Router Configuration

Example awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# default-information originate

default-metric (IPv6 RIPng)

Overview Use this command to specify the metrics to be assigned to redistributed RIPng routes.

Use the **no** variant of this command to reset the RIPng metric back to its default (1).

Syntax default-metric <1-16>
no default-metric [<1-16>]

Parameter	Description
<1-16>	Metric value.

Default By default, the RIPng metric value is set to 1.

Mode Router Configuration

Usage This command is used with the **redistribute (IPv6 RIPng)** command to make the routing protocol use the specified metric value for all redistributed RIPng routes, regardless of the original protocol that the route has been redistributed from.

Note, this metric is not applied to routes that are brought into RIPng by using the **route** command in router IPv6 RIP configuration mode. This metric is, though, applied to any RIPng aggregate routes that have been brought into the RIPng database due to the presence of a component route that was redistributed into RIPng.

Also note that the default-metric is applied to routes redistributed into RIPng with no metric assignment in the routemap associated with redistribution.

Example awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# default-metric 8

Related commands **ipv6 rip metric-offset**
redistribute (IPv6 RIPng)

distribute-list (IPv6 RIPng)

Overview Use this command to filter incoming or outgoing route updates using the access-list or the prefix-list.

Use the **no** variant of this command to disable this feature.

Syntax `distribute-list [<access-list>|prefix <prefix-list-name>] [in|out] [<interface>]`
`no distribute-list [<access-list>|prefix <prefix-list-name>] [in|out] [<interface>]`
`no distribute-list [prefix <prefix-list-name>] [in|out] [<interface>]`

Parameter	Description
<code><access-list></code>	Specifies the IPv6 access-list number or name to use.
<code><prefix-list-name></code>	Filter prefixes in routing updates. Specify the name of the IPv6 prefix-list to use.
<code><interface></code>	The interface for which distribute-list applies.
<code>in</code>	Filter incoming routing updates.
<code>out</code>	Filter outgoing routing updates.

Default Disabled

Mode Router Configuration

Usage notes Filter out incoming or outgoing route updates using the access-list or the prefix-list. If you do not specify the name of the interface, the filter is applied to all the interfaces.

Example To filter incoming or outgoing route updates, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# distribute-list prefix myfilter in vlan2
```

Related commands [ipv6 access-list extended \(named\)](#)
[ipv6 nd prefix](#)

ipv6 prefix-list

Overview Use this command to create an IPv6 prefix list or an entry in an existing prefix list.

Use the **no** variant of this command to delete a whole prefix list, a prefix list entry, or a description.

Syntax `ipv6 prefix-list <list-name> [seq <1-429496725>] {deny|permit} {any|<ipv6-prefix>} [ge <0-128>] [le <0-128>]`
`ipv6 prefix-list <list-name> description <text>`
`no ipv6 prefix-list <list-name> [seq <1-429496725>]`
`no ipv6 prefix-list <list-name> [description <text>]`

Parameter	Description
<list-name>	Specifies the name of a prefix list.
seq <1-429496725>	Sequence number of the prefix list entry.
deny	Specifies that the prefixes are excluded from the list.
permit	Specifies that the prefixes are included in the list.
<ipv6-prefix>	Specifies the IPv6 prefix and prefix length in hexadecimal in the format X:X::X:X/M.
any	Any prefix match. Same as ::0/0 le 128.
ge <0-128>	Specifies the minimum prefix length to be matched.
le <0-128>	Specifies the maximum prefix length to be matched.
description	Prefix list specific description.
<text>	Up to 80 characters of text description of the prefix list.

Mode Global Configuration

Usage notes When the device processes a prefix list, it starts to match prefixes from the top of the prefix list, and stops whenever a permit or deny occurs. To promote efficiency, use the **seq** parameter and place common permits or denials towards the top of the list. If you do not use the **seq** parameter, the sequence values are generated in a sequence of 5.

The parameters **ge** and **le** specify the range of the prefix lengths to be matched. The parameters **ge** and **le** are only used if an ip-prefix is stated. When setting these parameters, set the **le** value to be less than 128, and the **ge** value to be less than or equal to the **le** value and greater than the ip-prefix mask length.

Prefix lists implicitly exclude prefixes that are not explicitly permitted in the prefix list. This means if a prefix that is being checked against the prefix list reaches the end of the prefix list without matching a permit or deny, this prefix will be denied.

Example To check the first 32 bits of the prefix 2001:db8:: and that the subnet mask must be greater than or equal to 34 and less than or equal to 40, enter the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 prefix-list mylist seq 12345 permit
                2001:db8::/32 ge 34 le 40
```

Related commands **match ipv6 address**
show ipv6 prefix-list
show running-config ipv6 prefix-list

ipv6 rip metric-offset

Overview Use this command to increment the metric value on incoming routes for a specified interface. This command can be used to artificially inflate the metric value for routes learned on the specified interface. Routes learned on the specified interface are only used if the routes to the same destination with a lower metric value in the routing table are down.

Use the **no** variant of this command to reset the metric value on incoming routes to the default value (1). You can set the metric value for redistributed routes with **default-metric (IPv6 RIPng)** and **redistribute (IPv6 RIPng)** commands in Router Configuration mode.

Syntax `ipv6 rip metric-offset <1-16>`
`no ipv6 rip metric-offset <1-16>`

Parameter	Description
<1-16>	Specify an increment to the metric value on an incoming route. The metric value for RIPng routes is the hop count for the route.

Default The default RIPng metric value is 1.

Mode Interface Configuration for a VLAN interface.

Usage notes When a RIPng route is received on an interface, the metric value for the interface set by this command is added to the metric value of the route in the routing table. Note this command only increments the metric for incoming routes on a specified interface. Increasing the metric value for an interface increases the metric value of routes received on that interface. This changes the route selected from the routing table.

The RIPng metric is the hop count. At regular intervals of the routing update timer (which has a default value of 30 seconds), and at the time of change in the topology, the RIPng router sends update messages to other routers. The listening routers update their route table with the new route, and increase the metric value of the path by one (referred to as a hop count). The router recognizes the IPv6 address advertising router as the next hop, then sends the routing updates to other routers. A maximum allowable hop count is 15. If a router reaches a metric value of 16 or more, the destination is identified as unreachable.

For information about how AlliedWare Plus adds routes, see the **“Route Selection” Feature Overview and Configuration Guide**. See also the **default-metric (IPv6 RIPng)** and **redistribute (IPv6 RIPng)** commands to specify the metric for redistributed RIPng routes.

Examples To increment the metric-offset on the VLAN interface vlan2, enter the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# exit
awplus(config)# interface vlan2
awplus(config-if)# ipv6 rip metric-offset 1
```

To reset the metric-offset on the VLAN interface vlan2 to the default value, enter the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 rip metric-offset 1
```

Related commands **default-metric (IPv6 RIPng)**
show running-config

ipv6 rip split-horizon

Overview Use this command to perform the split-horizon action on the interface. The default is split-horizon with poisoned reverse.

Use the **no** variant of this command to disable this function.

Syntax `ipv6 rip split-horizon [poisoned]`
`no ipv6 rip split-horizon`

Parameter	Description
split-horizon	Perform split-horizon without poisoned reverse
poisoned	Performs split-horizon with poisoned reverse.

Default Split-horizon with poisoned reverse is the default.

Mode Interface Configuration for a VLAN interface.

Usage notes Use this command to avoid including routes in updates sent to the same gateway from which they were learned. Using the **split horizon** command omits routes learned from one neighbor, in updates sent to that neighbor. Using the **poisoned** parameter with this command includes such routes in updates, but sets their metrics to infinity. Thus, advertising that these routes are not reachable.

Examples To perform split-horizon with poisoned reverse on the VLAN interface vlan2, enter the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# exit
awplus(config)# interface vlan2
awplus(config-if)# ipv6 rip split-horizon poisoned
```

To disable split-horizon on the VLAN interface vlan2, enter the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 rip split-horizon
```

Related Commands [show running-config](#)

ipv6 router rip

Overview Use this command to enable RIPng routing on an interface.
Use the **no** variant of this command to disable RIPng routing on an interface.

Syntax `ipv6 router rip`
`no ipv6 router rip`

Default RIPng routing is disabled by default.

Mode Interface Configuration for a VLAN interface.

Examples To enable RIPng routing on the VLAN interface vlan2, enter the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# exit
awplus(config)# interface vlan2
awplus(config-if)# ipv6 router rip
```

To disable RIPng routing on the VLAN interface vlan2, enter the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 router rip
```

neighbor (IPv6 RIPng)

Overview Use this command to specify a neighbor router.
Use the **no** variant of this command to disable the specific router.

Syntax neighbor <ipv6-link-local-addr> <interface>
no neighbor <ipv6-link-local-addr> <interface>

Parameter	Description
<ipv6-link-local-addr>	Specify the link-local IPv6 address (in the format X:X::X:X) of a neighboring router to exchange routing information with.
<interface>	The interface to exchange routing information over.

Mode Router Configuration

Usage Use this command to exchange non broadcast routing information. It can be used multiple times for additional neighbors.

The **passive-interface (IPv6 RIPng)** command disables sending routing updates on an interface. If you want to send routing updates only to specific neighbors, use the **passive-interface (IPv6 RIPng)** command and this **neighbor** command together.

Examples To set 2001:db8:1::1 as a neighbor via interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# neighbor 2001:db8:1::1 vlan2
```

To stop having 2001:db8:1::1 as a neighbor via interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# no neighbor 2001:db8:1::1 vlan2
```

Related commands **passive-interface (IPv6 RIPng)**

offset-list (IPv6 RIPng)

Overview Use this command to add an offset to in and out metrics to routes learned through RIPng.

Use the **no** variant of this command to remove an offset list.

Syntax `offset-list {<access-list-number>|<access-list-name>} {in|out} <offset> [<interface>]`
`no offset-list {<access-list-number>|<access-list-name>} {in|out} <offset> [<interface>]`

Parameter	Description
<code><access-list-number></code>	Specify an access-list number to apply to an offset-list.
<code><access-list-name></code>	Specify and access-list name to apply to an offset-list.
<code>in</code>	Indicates the access-list will be used for metrics of incoming advertised routes
<code>out</code>	Indicates the access-list will be used for metrics of outgoing advertised routes
<code><offset></code>	<code><0-16></code> Specifies that the offset is used for metrics of networks matching the access-list
<code><interface></code>	The interface to match. For instance: <code>vlan2</code> .

Default The default offset value is the metric value of the interface over which the updates are being exchanged.

Mode Router Configuration

Usage notes Use this command to specify the offset value that is added to the routing metric. When the networks match the access list the offset is applied to the metrics. No change occurs if the offset value is zero.

Example In this example the router examines the RIPng updates being sent out from interface `vlan2` and adds 8 hops to the routes matching the ip addresses specified in the access list 2.

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# offset-list mylist in 8 vlan2
```


passive-interface (IPv6 RIPng)

Overview Use this command to enable suppression of routing updates on an interface.

Use the **no** variant of this command to disable this function.

Syntax `passive-interface <interface>`
`no passive-interface <interface>`

Parameter	Description
<code><interface></code>	The interface to suppress routing updates on.

Default Disabled

Mode Router Configuration

Examples To suppress routing updates on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# passive-interface vlan2
```

To stop suppressing routing updates on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# no passive-interface vlan2
```

recv-buffer-size (IPv6 RIPng)

Overview Use this command to configure the RIPng UDP (User Datagram Protocol) receive-buffer size. This should improve UDP reliability by avoiding UDP receive buffer overruns.

Use the **no** variant of this command to unset the configured RIPng UDP receive-buffer size and set it back to the system default of 196608 bits.

Syntax `recv-buffer-size <8192-2147483647>`
`no recv-buffer-size [<8192-2147483647>]`

Default The RIPng UDP receive-buffer-size is 196608 bits by default, and is reset to the default using the **no** variant of this command.

Mode Router Configuration

Examples To configure the RIPng UPD, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# recv-buffer-size 23456789
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# no recv-buffer-size 23456789
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# no recv-buffer-size
```

redistribute (IPv6 RIPng)

Overview Use this command to redistribute information from other routing protocols into RIPng.

Use the **no** variant of this command to disable the specified redistribution. The parameters **metric** and **route-map** may be used on this command, but have no effect.

Syntax redistribute {connected|static|ospf} [metric <0-16>] [route-map <route-map>]
no redistribute {connected|static|ospf} [metric <0-16>] [route-map <route-map>]

Parameter	Description
<0-16>	Optional. Specifies the metric value to be used when redistributing information. If a value is not specified, and no value is specified using the default-metric (IPv6 RIPng) command, the default is one.
<route-map>	Optional. Specifies route-map to be used to redistribute information.
connected	Redistribute from connected routes.
static	Redistribute from static routes.
ospf	Redistribute from Open Shortest Path First (OSPF).

Default By default, the RIPng metric value is set to 1.

Mode Router Configuration

Example To redistribute information from other routing protocols into RIPng, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# redistribute static route-map mymap
awplus(config-router)# redistribute static metric 8
```

Related commands **default-metric (IPv6 RIPng)**

route (IPv6 RIPng)

Overview Use this command to configure static RIPng routes.
Use the **no** variant of this command to disable this function.

Syntax route <ipv6-addr/prefix-length>
no route <ipv6-addr/prefix-length>

Parameter	Description
<ipv6-addr/prefix-length>	Specify the IPv6 Address in format X:X::X:X/ Prefix- Length. The prefix-length is a decimal integer between 1 and 128.

Mode Router Configuration

Usage notes Use this command to add a static RIPng route. After adding the RIPng route, the route can be checked in the RIPng routing table.

Example To configure static RIPng routes, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# route 2001:db8::1/64
```

Related commands **show ipv6 rip**
clear ipv6 rip route

router ipv6 rip

Overview Use this global command to enter Router Configuration mode to enable a RIPng routing process.

Use the **no** variant of this command to disable the RIPng routing process.

Syntax router ipv6 rip
no router ipv6 rip

Mode Global Configuration

Example To enable a RIPng routing process, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)#
```

service ripng

Overview Use this command to enable the RIPng service.

Use the **no** version of the command to disable the RIPng service if you are not using it.

Syntax service ripng
no service ripng

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using RIPng. Enable it before configuring RIPng.
If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the RIPng service, use the commands:

```
awplus# configure terminal
awplus(config)# service ripng
```

To disable the RIPng service, use the commands:

```
awplus# configure terminal
awplus(config)# no service ripng
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show debugging ipv6 rip

Overview Use this command to see what debugging is turned on for RIPng options such as: nsm debugging, RIPng event debugging, RIPng packet debugging, and RIPng nsm debugging.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging ipv6 rip

Mode User Exec and Privileged Exec

Usage notes Use this command to display the debug status of RIPng.

Example To display the RIPng debugging status, use the following command:
awplus# show debugging ipv6 rip

show ipv6 prefix-list

Overview Use this command to display the prefix-list entries.

Note that this command is valid for RIPng only.

Syntax `show ipv6 prefix-list [<name>|detail|summary]`

Parameter	Description
<name>	Specify the name of an individual IPv6 prefix list.
detail	Specify this parameter to show detailed output for all IPv6 prefix lists.
summary	Specify this parameter to show summary output for all IPv6 prefix lists.

Mode User Exec and Privileged Exec

Example `awplus# show ipv6 prefix-list`
`awplus# show ipv6 prefix-list 10.10.0.98/8`
`awplus# show ipv6 prefix-list detail`

Related commands [ipv6 prefix-list](#)

show ipv6 protocols rip

Overview Use this command to display RIPng process parameters and statistics.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 protocols rip

Mode User Exec and Privileged Exec

Example To display RIPng process parameters and statistics, use the following command:

```
awplus# show ipv6 protocols rip
```

Output The following shows typical output.

Example output from the show ipv6 protocols rip command

```
awplus#show ipv6 protocols rip
Routing Protocol is "RIPng"
  Sending updates every 30 seconds with +/-5 seconds, next due
  in 6 seconds
  Timeout after 180 seconds, garbage collect after 120 seconds
  Outgoing update filter list for all interface is not set
  Incoming update filter list for all interface is not set
  Default redistribute metric is 1
  Redistributing:
  Interface
    vlan3
  Routing for Networks:
    fe80::200:cdff:fe27:c086 vlan1
```

show ipv6 rip

Overview Use this command to show RIPng routes.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 rip

Mode User Exec and Privileged Exec

Example To display RIPng routes, use the following command:

```
awplus# show ipv6 rip
```

Output The following shows typical output.

Example output from the show ipv6 rip command:

```
awplus#show ipv6 rip
Codes: R - RIP, Rc - RIP connected, Rs - RIP static, Ra - RIP
aggregated, Rcx - RIP connect suppressed, Rsx - RIP static
suppressed, C - Connected, S - Static, O - OSPF, B - BGP
```

	Network	Next Hop	If	Met	Tag	Time
R	2001:db8:1::/48	2001:db8:2::/48	vlan3	3	0	02:28
C	2001:db8:3::/48	::	vlan2	1	0	
Ra	2001:db8:4::/48		--	1	0	
Rs	2001:db8:5::/48	2001:db8:1::/48	vlan3	3	0	02:32
Cs	2001:db8:6::/48	::	vlan3	1	0	

Related commands [show ipv6 rip database](#)

show ipv6 rip database

Overview Use this command to display information about the RIPng database.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 rip database [full]

Parameter	Description
full	Display all IPv6 RIPng full database entries including sub-optimal routes.

Mode User Exec and Privileged Exec

Example To display information about the RIPng database, use the following command:

```
awplus# show ipv6 rip database
```

Output The following shows typical output.

Example output from the show ipv6 rip database command:

Codes: R - RIP, Rc - RIP connected, Rs - RIP static, Ra - RIP aggregated, Rcx - RIP connect suppressed, Rsx - RIP static suppressed, C - Connected, S - Static, O - OSPF, B - BGP						
	Network	Next Hop	If	Met	Tag	Time
R	2001:db8:1::/48	2001:db8:2::/48	vlan3	3	0	02:28
C	2001:db8:3::/48	::	vlan2	1	0	
Ra	2001:db8:4::/48	--	--	1	0	
Rs	2001:db8:5::/48	2001:db8:1::/48	vlan3	3	0	02:32
Cs	2001:db8:6::/48	:: vlan3 1 0				

Related commands [show ipv6 rip](#)

show ipv6 rip interface

Overview Use this command to display information about the RIPng interfaces. You can specify an interface name to display information about a specific interface.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 rip interface [<interface>]

Parameter	Description
<interface>	The interface to display information about.

Mode User Exec and Privileged Exec

Example To display RIPng interface information, use the following command:
awplus# show ipv6 rip interface

Output The following shows typical output.

Example output from the show ipv6 rip interface command

```
awplus# show ipv6 rip interface
lo is up, line protocol is up
  RIPng is not enabled on this interface
vlan1 is down, line protocol is down
  RIPng is not enabled on this interface
of0 is up, line protocol is up
  RIPng is not enabled on this interface
vlan2 is up, line protocol is up
  RIPng is not enabled on this interface
```

timers (IPv6 RIPng)

Overview Use this command to adjust the RIPng routing network timers.
Use the **no** variant of this command to restore the defaults.

Syntax `timers basic <update> <timeout> <garbage>`
`no timers basic`

Parameter	Description
<code><update></code>	<code><5-2147483647></code> Specifies the RIPng routing table update timer in seconds. The default is 30 seconds.
<code><timeout></code>	<code><5-2147483647></code> Specifies the RIPng routing information timeout timer in seconds. The default is 180 seconds. After this interval has elapsed and no updates for a route are received, the route is declared invalid.
<code><garbage></code>	<code><5-2147483647></code> Specifies the RIPng routing garbage collection timer in seconds. The default is 120 seconds.

Default The default RIPng routing table update timer default is 30 seconds, the default RIPng routing information timeout timer is 180 seconds, and the default RIPng routing garbage collection timer is 120 seconds. The **no** variant of this command restores the default RIPng routing timers.

Mode Router Configuration

Example To adjust the RIPng routing network timers, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 rip
awplus(config-router)# timers basic 30 180 120
```

undebg ipv6 rip

Overview Use this command to disable debugging options of RIPng events, RIPng packets, and communication between RIPng and NSM processes.

Syntax `undebg ipv6 rip [all|events|nsm|packet [recv|send][detail]]`

Parameter	Description
all	Disables all RIPng debugging.
events	Disable the display of RIPng events information.
nsm	Disable the display of RIPng and NSM communication.
packet	Disable debugging of specified RIPng packets only.
recv	Disable the display of information for received packets.
send	Disable the display of information for sent packets.
detail	Disable the display of detailed information for sent or received packets.

Mode Privileged Exec and Global Configuration

Example To disable debugging options, use the following command:

```
awplus# undebg ipv6 rip events
awplus# undebg ipv6 rip all
awplus# undebg ipv6 rip packet send
awplus# undebg ipv6 rip packet recv detail
```

Related commands [debug ipv6 rip](#)

26

OSPF Commands

- Contents**
- **Introduction** on page 1158
 - **area default-cost** on page 1159
 - **area authentication** on page 1160
 - **area filter-list** on page 1161
 - **area nssa** on page 1162
 - **area range** on page 1164
 - **area stub** on page 1166
 - **area virtual-link** on page 1167
 - **area virtual-link authentication** on page 1169
 - **area virtual-link authentication message-digest** on page 1171
 - **area virtual-link authentication null** on page 1173
 - **area virtual-link dead-interval** on page 1174
 - **area virtual-link hello-interval** on page 1176
 - **area virtual-link retransmit-interval** on page 1178
 - **area virtual-link transmit-delay** on page 1180
 - **auto-cost reference bandwidth** on page 1182
 - **bandwidth** on page 1185
 - **capability opaque** on page 1186
 - **capability restart** on page 1187
 - **clear ip ospf process** on page 1188
 - **compatible rfc1583** on page 1189
 - **debug ospf events** on page 1190
 - **debug ospf ifsm** on page 1191
 - **debug ospf lsa** on page 1192
 - **debug ospf n fsm** on page 1193
 - **debug ospf nsm** on page 1194
 - **debug ospf packet** on page 1195
 - **debug ospf route** on page 1196
 - **default-information originate** on page 1197
 - **default-metric (OSPF)** on page 1199
 - **distance (OSPF)** on page 1200
 - **distribute-list (OSPF)** on page 1202
 - **enable db-summary-opt** on page 1205
 - **host area** on page 1206
 - **ip ospf authentication** on page 1207
 - **ip ospf authentication-key** on page 1208
 - **ip ospf cost** on page 1210

- **ip ospf database-filter** on page 1211
- **ip ospf dead-interval** on page 1212
- **ip ospf disable all** on page 1213
- **ip ospf hello-interval** on page 1214
- **ip ospf message-digest-key** on page 1215
- **ip ospf mtu** on page 1217
- **ip ospf mtu-ignore** on page 1218
- **ip ospf network** on page 1219
- **ip ospf priority** on page 1220
- **ip ospf resync-timeout** on page 1221
- **ip ospf retransmit-interval** on page 1222
- **ip ospf transmit-delay** on page 1223
- **max-concurrent-dd** on page 1224
- **maximum-area** on page 1225
- **neighbor (OSPF)** on page 1226
- **network area** on page 1228
- **ospf abr-type** on page 1230
- **ospf restart grace-period** on page 1231
- **ospf restart helper** on page 1232
- **ospf router-id** on page 1234
- **overflow database** on page 1235
- **overflow database external** on page 1236
- **passive-interface (OSPF)** on page 1237
- **redistribute (OSPF)** on page 1238
- **restart ospf graceful** on page 1240
- **router ospf** on page 1241
- **router-id** on page 1242
- **service ospf** on page 1243
- **show debugging ospf** on page 1244
- **show ip ospf** on page 1245
- **show ip ospf border-routers** on page 1248
- **show ip ospf database** on page 1249
- **show ip ospf database asbr-summary** on page 1251
- **show ip ospf database external** on page 1252
- **show ip ospf database network** on page 1254
- **show ip ospf database nssa-external** on page 1256
- **show ip ospf database opaque-area** on page 1258
- **show ip ospf database opaque-as** on page 1259
- **show ip ospf database opaque-link** on page 1260
- **show ip ospf database router** on page 1261
- **show ip ospf database summary** on page 1263
- **show ip ospf interface** on page 1266
- **show ip ospf neighbor** on page 1267
- **show ip ospf route** on page 1269
- **show ip ospf virtual-links** on page 1270
- **show ip protocols ospf** on page 1271
- **summary-address** on page 1272
- **timers spf exp** on page 1274

- **undebug ospf events** on page 1275
- **undebug ospf ifsm** on page 1276
- **undebug ospf lsa** on page 1277
- **undebug ospf nfsm** on page 1278
- **undebug ospf nsm** on page 1279
- **undebug ospf packet** on page 1280
- **undebug ospf route** on page 1281

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure OSPF. For more information, see the **OSPF Feature Overview and Configuration Guide**.

area default-cost

Overview This command specifies a cost for the default summary route sent into a stub or NSSA area.

The **no** variant of this command removes the assigned default-route cost.

Syntax `area <area-id> default-cost <0-16777215>`
`no area <area-id> default-cost`

Parameter	Other parameter descriptions
<i>default-cost</i>	Indicates the cost for the default summary route used for a stub or NSSA area. Default: 1

Mode Router Configuration

Usage The default-cost option provides the metric for the summary default route, generated by the area border router, into the NSSA or stub area. Use this option only on an area border router that is attached to the NSSA or stub area. Refer to the RFC 3101 for information on NSSA.

Example To set the default cost to 10 in area 1 for the OSPF instance 100, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 default-cost 10
```

Related commands [area nssa](#)
[area stub](#)

area authentication

Overview Use this command to enable authentication for an OSPF area. Specifying the area authentication sets the authentication to Type 1 authentication or the Simple Text password authentication (details in RFC 2328).

The **no** variant of this command removes the authentication specification for an area.

Syntax `area <area-id> authentication [message-digest]`
`no area <area-id> authentication`

Parameter	Other parameter descriptions
message-digest	Enables MD5 authentication in the OSPF area.

Default By default, no authentication occurs.

Mode Router Configuration

Usage All OSPF packets transmitted in this **area** must have the same password in their OSPF header. This ensures that only routers that have the correct password may join the routing domain.

Give all routers that are to communicate with each other through OSPF the same authentication password.

Use the **ip ospf authentication-key** command to specify a Simple Text password. Use the **ip ospf message-digest-key** command to specify MD5 password.

Example

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 authentication
```

Related commands **ip ospf authentication**
ip ospf message-digest-key

area filter-list

Overview This command configures filters to advertise summary routes on Area Border Routers (ABR).

This command is used to suppress particular intra-area routes from/to an area to/from the other areas. You can use this command in conjunction with either the access-list or the prefix-list command.

The **no** variant of this command removes the filter configuration.

Syntax area <area-id> filter-list access <access-list> {in|out}
 area <area-id> filter-list prefix <prefix-list> {in|out}
 no area <area-id> filter-list access <access-list> {in|out}
 no area <area-id> filter-list prefix <prefix-list> {in|out}

Parameter	Other parameter descriptions
access	Use access-list to filter summary.
<access-list>	Name of an access-list.
prefix	Use prefix-list to filter summary.
<prefix-list>	Name of a prefix-list.
in	Filter routes from the other areas to this area.
out	Filter routes from this area to the other areas.

Mode Router Configuration

Example To configure filters to advertise summary routes, use the following commands:

```
awplus# configure terminal
awplus(config)# access-list 1 deny 172.22.0.0
awplus(config)# router ospf 100
awplus(config-router)# area 1 filter-list access 1 in
```

area nssa

Overview This command sets an area as a Not-So-Stubby-Area (NSSA). By default, no NSSA area is defined.

Use this command to simplify administration if you are connecting a central site using OSPF to a remote site that is using a different routing protocol. You can extend OSPF to cover the remote connection by defining the area between the central router and the remote router as an NSSA.

There are no external routes in an OSPF stub area, so you cannot redistribute from another protocol into a stub area. A NSSA allows external routes to be flooded within the area. These routes are then leaked into other areas. Although, the external routes from other areas still do not enter the NSSA. You can either configure an area to be a stub area or an NSSA, not both.

The **no** variant of this command removes this designation.

Syntax `area <area-id> nssa [default-information-originate <metric> | no-redistribution | no-summary | translator-role <role> ]`
`no area <area-id> nssa [default-information-originate | no-redistribution | no-summary | translator-role ]`

Parameter	Other parameter descriptions
default-information-originate	Originate Type-7 default LSA into NSSA.
<metric>	The external or internal metric. Specify the following:
	metric<0-16777214> The metric value.
	metric-type<1-2> External metric type.
no-redistribution	Do not redistribute external route into NSSA.
no-summary	Do not inject inter-area route into NSSA.
translator-role	Specify NSSA-ABR translator-role.
<role>	The role type. Specify one of the following keywords:
	always Router always translate NSSA- LSA to Type-5 LSA.
	candidate Router may translate NSSA- LSA to Type-5 LSA if it is elected.
	never Router never translate NSSA- LSA.

Mode Router Configuration

Example `awplus# configure terminal`
`awplus(config)# router ospf 100`
`awplus(config-router)# area 0.0.0.51 nssa`
`awplus(config-router)# area 3 nssa translator-role candidate no-redistribution default-information-originate metric 34 metric-type 2`

Related commands [area default-cost](#)

area range

Overview Use this command to summarize OSPF routes at an area boundary, configuring an IPv4 address range which consolidates OSPF routes. By default, this feature is not enabled.

A summary route created by this command is then advertised to other areas by the Area Border Routers (ABRs). In this way, routing information is condensed at area boundaries and outside the area so that routes are exchanged between areas in an efficient manner.

If the network numbers in an area are arranged into sets of contiguous routes, the ABRs can be configured to advertise a summary route that covers all the individual networks within the area that fall into the specified range.

Use the cost parameter to specify a metric that will be advertised in the summary Link State Advertisement (LSA), rather than relying on the standard method to calculate the metric for the LSA.

The **no** variant of this command disables this function and restores default behavior.

Syntax `area <area-id> range <ip-addr/prefix-length> [advertise] [cost <0-16777215>]`
`area <area-id> range <ip-addr/prefix-length> not-advertise`
`no area <area-id> range <ip-addr/prefix-length>`

Parameter	Other parameter descriptions
<code><ip-addr/prefix-length></code>	The area range prefix and length.
<code>advertise</code>	Advertise this range as a summary route into other areas.
<code>not-advertise</code>	Does not advertise this range.
<code>cost</code>	Optionally override the metric that would normally be calculated for this summary with a user-defined cost to be advertised for this summary LSA. Specify the metric to be advertised for this route in the range 0-16777215.

Default The area range is not configured by default. The area range is advertised if it is configured.

Mode Router Configuration

Usage notes You can configure multiple ranges on a single area with multiple instances of this command, so OSPF summarizes addresses for different sets of IPv4 address ranges.

Ensure OSPF IPv4 routes exist in the area range for advertisement before using this command.

Example `awplus# configure terminal`
`awplus(config)# router ospf 100`
`awplus(config-router)# area 1 range 192.16.0.0/16`
`awplus(config-router)# area 1 range 203.18.0.0/16 cost 70`

To remove a cost configured on an area range, re-enter the area range without the optional cost parameter. This will set the metric calculation back to the default algorithm.

`awplus(config-router)# area 1 range 207.14.0.0/16 cost 35`
`awplus(config-router)# area 1 range 207.14.0.0/16`

Command changes Version 5.5.0-0.1: parameter **cost** added

area stub

Overview This command defines an OSPF area as a stub area. By default, no stub area is defined.

Use this command when routers in the area do not require learning about summary LSAs from other areas. You can define the area as a totally stubby area by configuring the Area Border Router of that area using the **area stub no-summary** command.

There are two stub area router configuration commands: the **area stub** and **area default-cost** commands. In all routers attached to the stub area, configure the area by using the **area stub** command. For an area border router (ABR) attached to the stub area, also use the **area default-cost** command.

The **no** variant of this command removes this definition.

Syntax `area <area-id> stub [no-summary]`
`no area <area-id> stub [no-summary]`

Parameter	Other parameter descriptions
no-summary	Stops an ABR from sending summary link advertisements into the stub area.

Mode Router Configuration

Example `awplus# configure terminal`
`awplus(config)# router ospf 100`
`awplus(config-router)# area 1 stub`

Related commands [area default-cost](#)

area virtual-link

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas.

In OSPF, all non-backbone areas must be connected to a backbone area. If the connection to the backbone is lost, the virtual link repairs the connection.

You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

The **no** variant of this command removes the virtual link.

Syntax `area <area-id> virtual-link <ip-addr>`
`no area <area-id> virtual-link <ip-addr>`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.

Mode Router Configuration

Example To configure a virtual link, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50
```

Related commands

- area virtual-link**
- area virtual-link authentication**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link dead-interval**
- area virtual-link hello-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

area virtual-link authentication

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas, and specifies simple password-based authentication on it.

You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

The **no** variant of this command turns off authentication and/or removes the authentication key.

Syntax `area <area-id> virtual-link <ip-addr> authentication
authentication-key [encrypted] <password>`
`no area <area-id> virtual-link <ip-addr> authentication
[authentication-key]`

Parameter	Other parameter descriptions
<ip-addr>	The OSPF router ID of the virtual link neighbor.
authentication-key	Specifies to use a password for this virtual link
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
<password>	An 8 character password

Mode Router Configuration

Usage notes If you want to, you can enter this authentication command as two separate commands instead. First enable authentication and then specify the key:

```
awplus(config-router)# area <area-id> virtual-link <ip-addr>  
authentication
```

```
awplus(config-router)# area <area-id> virtual-link <ip-addr>  
authentication-key [encrypted] <password>
```

Example To configure a virtual link with a password of 'very-sec', use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50
authentication authentication-key very-sec
```

Related commands

- area authentication**
- area virtual-link**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link dead-interval**
- area virtual-link hello-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

Command changes Version 5.5.4-0.1: **encrypted** parameter added

area virtual-link authentication message-digest

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas, and specifies MD5-based authentication on it.

You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

The **no** variant of this command turns off authentication and/or removes the MD5 key.

Syntax `area <area-id> virtual-link <ip-addr> authentication message-digest message-digest-key <1-255> md5 [encrypted] <password>`
`no area <area-id> virtual-link <ip-addr> authentication [message-digest message-digest-key <1-255>]`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.
<code>message-digest-key <1-255></code>	The key ID number.
<code>md5</code>	Specifies to use MD5 encryption algorithm.
<code>encrypted</code>	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
<code><password></code>	Password for MD5 of 16 characters.

Mode Router Configuration

Usage notes If you want to, you can enter this authentication command as two separate commands instead. First enable message-digest and then specify the key:

```
awplus(config-router)# area <area-id> virtual-link <ip-addr>
authentication message-digest
awplus(config-router)# area <area-id> virtual-link <ip-addr>
message-digest-key <1-255> md5 [encrypted] <password>
```

Example To configure a virtual link to use MD5 hashing with a password of 'very-very-secret', use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50
authentication message-digest message-digest-key 1 md5 very-
very-secret
```

Related commands

- [area authentication](#)
- [area virtual-link](#)
- [area virtual-link authentication](#)
- [area virtual-link authentication null](#)
- [area virtual-link dead-interval](#)
- [area virtual-link hello-interval](#)
- [area virtual-link retransmit-interval](#)
- [area virtual-link transmit-delay](#)
- [show ip ospf](#)
- [show ip ospf virtual-links](#)

Command changes Version 5.5.4-0.1: **encrypted** parameter added

area virtual-link authentication null

Overview This command overrides any previously-set password or message digest authentication for the specified virtual link. Using this command stops the virtual link from using authentication.

The **no** variant of this command removes the null setting.

Syntax `area <area-id> virtual-link <ip-addr> authentication null`
`no area <area-id> virtual-link <ip-addr> authentication null`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.

Mode Router Configuration

Example To configure a virtual link, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50
```

Related commands

- [area authentication](#)
- [area virtual-link](#)
- [area virtual-link authentication](#)
- [area virtual-link authentication message-digest](#)
- [area virtual-link dead-interval](#)
- [area virtual-link hello-interval](#)
- [area virtual-link retransmit-interval](#)
- [area virtual-link transmit-delay](#)
- [show ip ospf](#)
- [show ip ospf virtual-links](#)

area virtual-link dead-interval

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas.

It specifies the dead interval. If no packets are received from a particular neighbor for dead-interval seconds, the router considers that neighboring router as being off-line.

The **no** variant of this command returns the dead interval to its default.

Syntax area <area-id> virtual-link <ip-addr> dead-interval <1-65535>
no area <area-id> virtual-link <ip-addr> dead-interval <1-65535>

Parameter	Other parameter descriptions
<ip-addr>	The OSPF router ID of the virtual link neighbor.
dead-interval <1-65535>	The interval the router waits before considers that neighboring router as being off-line if it receives no packets from the neighbor, in seconds.

Default 40 seconds

Mode Router Configuration

Usage notes You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

Example To create a virtual link and set its dead interval to 20 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50 dead-interval 20
```

Related commands

- area virtual-link**
- area virtual-link authentication**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link hello-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

area virtual-link hello-interval

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas.

It specifies the hello interval. A short hello interval results in the router detecting topological changes faster but also an increase in the routing traffic.

Use the same hello interval on all routers attached to a common network.

The **no** variant of this command returns the hello interval to its default.

Syntax `area <area-id> virtual-link <ip-addr> hello-interval <1-65535>`
`no area <area-id> virtual-link <ip-addr> hello-interval <1-65535>`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.
<code>hello-interval <1-65535></code>	The interval between hello packets, in seconds.

Default 10 seconds

Mode Router Configuration

Usage notes You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

Example To create a virtual link and set its hello interval to 5 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50 hello-interval 5
```

Related commands

- area virtual-link**
- area virtual-link authentication**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link dead-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

area virtual-link retransmit-interval

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas.

It specifies the retransmit interval, which is the expected round-trip delay between any two routers in a network. Set the value to be greater than the expected round-trip delay to avoid needless retransmissions.

The **no** variant of this command returns the retransmit interval to its default.

Syntax `area <area-id> virtual-link <ip-addr> retransmit-interval <1-3600>`

`no area <area-id> virtual-link <ip-addr> retransmit-interval <1-3600>`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.
<code>retransmit-interval <1-3600></code>	The interval the router waits before it retransmits a packet, in seconds.

Default 5 seconds

Mode Router Configuration

Usage notes You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

Example To create a virtual link and set its retransmit interval to 6 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50
retransmit-interval 6
```

Related commands

- area virtual-link**
- area virtual-link authentication**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link dead-interval**
- area virtual-link hello-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

area virtual-link transmit-delay

Overview This command configures a link between two backbone areas that are physically separated through other non-backbone areas.

It specifies the transmit delay, which is the time taken to transmit a link state update packet on the interface. Before transmission, the link state advertisements in the update packet are incremented by this amount. Set the transmit delay to be greater than zero. Also, take into account the transmission and propagation delays for the interface.

The **no** variant of this command returns the transmit delay to its default.

Syntax `area <area-id> virtual-link <ip-addr> transmit-delay <1-3600>`
`no area <area-id> virtual-link <ip-addr> transmit-delay <1-3600>`

Parameter	Other parameter descriptions
<code><ip-addr></code>	The OSPF router ID of the virtual link neighbor.
<code>transmit-delay <1-3600></code>	The interval the router waits before it transmits a packet, in seconds.

Default 1 second

Mode Router Configuration

Usage notes You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area ID, i.e. the area ID of the non backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ip ospf** command.

Example To create a virtual link and set its transmit delay to 2 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50 transmit-delay 2
```


Related commands

- area virtual-link**
- area virtual-link authentication**
- area virtual-link authentication message-digest**
- area virtual-link authentication null**
- area virtual-link dead-interval**
- area virtual-link hello-interval**
- area virtual-link retransmit-interval**
- area virtual-link transmit-delay**
- show ip ospf**
- show ip ospf virtual-links**

auto-cost reference bandwidth

Overview This command controls how OSPF calculates default metrics for the interface.

Use the **no** variant of this command to assign cost based only on the interface bandwidth.

Syntax auto-cost reference-bandwidth <1-4294967>
no auto-cost reference-bandwidth

Parameter	Description
<1-4294967>	The reference bandwidth in terms of Mbits per second (Mbps).

Default 1000 Mbps

Usage notes By default, OSPF calculates the OSPF metric for an interface by dividing the reference bandwidth by the interface bandwidth. The default for the reference bandwidth is 1000 Mbps. As a result, if this default is used, there is very little difference between the metrics applied to interfaces of increasing bandwidth beyond 1000 Mbps.

The auto-cost command is used to alter this reference bandwidth in order to give a real difference between the metrics of high bandwidth links of differing bandwidths. In a network that has multiple links with high bandwidths, specify a larger reference bandwidth value to differentiate the costs on those links.

Cost is calculated by dividing the reference bandwidth (Mbps) by the layer 3 interface (Switched Virtual Interface (SVI), Loopback or Ethernet interface) bandwidth. Interface bandwidth may be altered by using the **bandwidth** command as the SVI does not auto detect the bandwidth based on the speed of associated switch ports.

When the reference bandwidth calculation results in a cost integer greater than 1 but contains a fractional value (value after the decimal point), the result rounds down to the nearest integer. The following example shows how the cost is calculated.

The reference bandwidth is 1000 Mbps and the interface bandwidth is 7 Mbps.

Calculation = $1000/7$

Calculation result = 142.85 (integer of 142, fractional value of 0.85)

Result after rounding down to the nearest integer = 142 (Interface cost is 142)

When the reference bandwidth calculation results in a cost less than 1, it is rounded up to the nearest integer which is 1. The following example shows how the cost is calculated.

The reference bandwidth is 1000 Mbps and the interface bandwidth is 10000 Mbps.

Calculation = $1000/10000$

Calculation result = 0.1

Result after rounding up to the nearest integer = 1 (Interface cost is 1)

The auto-cost reference bandwidth value should be consistent across all OSPF routers in the OSPF process.

Note that using the **ip ospf cost** command on a layer 3 interface will override the cost calculated by this command.

Mode Router Configuration

Example

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# auto-cost reference-bandwidth 1000
```

Related [ip ospf cost](#)
commands

bandwidth

Overview Use this command to specify the maximum bandwidth to be used for each interface. The bandwidth value is in bits per second. OSPF uses this to calculate metrics for the interface.

The **no** variant of this command removes any applied bandwidth value. It replaces it with a value equal to the lowest port speed within that VLAN.

Syntax `bandwidth <bandwidth-setting>`
`no bandwidth`

Parameter	Description
<code><bandwidth-setting></code>	Sets the bandwidth for the interface. Enter a value in the range 1 to 10000000000 bits per second. Note that to avoid entering many zeros, you can add k, m, or g to internally add 3, 6 or 9 zeros to the number entered. For example entering 1k is the same as entering 1000.

Mode Interface Configuration for a VLAN interface.

Example To set the bandwidth on VLAN2 to be 10 Mbps, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# bandwidth 100000000
or
awplus(config-if)# bandwidth 10m
```

Related commands [show running-config access-list](#)
[show interface](#)

capability opaque

Overview This command enables opaque-LSAs. Opaque-LSAs are Type 9, 10 and 11 LSAs that deliver information used by external applications.

Use the **no** variant of this command to disable opaque-LSAs.

Syntax capability opaque
no capability opaque

Default By default, opaque-LSAs are enabled.

Mode Router Configuration

Example awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# no capability opaque

capability restart

Overview This command enables OSPF Graceful Restart or restart signaling features. By default, this is enabled.

Use the **no** variant of this command to disable OSPF Graceful Restart and restart signaling features.

Syntax `capability restart [graceful|signaling]`
`no capability restart`

Parameter	Description
graceful	Enable graceful OSPF restart.
signaling	Enable OSPF restart signaling.

Default Graceful restart

Mode Router Configuration

Example `awplus# configure terminal`
`awplus(config)# router ospf 100`
`awplus(config-router)# capability restart graceful`

clear ip ospf process

Overview This command clears and restarts the OSPF routing process. Specify the Process ID to clear one particular OSPF process. When no Process ID is specified, this command clears all running OSPF processes.

Syntax `clear ip ospf [<0-65535>] process`

Parameter	Description
<0-65535>	The Routing Process ID.

Mode Privileged Exec

Example `awplus# clear ip ospf process`

compatible rfc1583

Overview This command changes the method used to calculate summary route to the that specified in RFC 1583. By default, OSPF uses the method specified in RFC 2328.

RFC 1583 specifies a method for calculating the metric for summary routes based on the minimum metric of the component paths available. RFC 2328 specifies a method for calculating metrics based on maximum cost.

It is possible that some ABRs in an area might conform to RFC 1583 and others support RFC 2328, which could lead to incompatibility in their interoperation. This command addresses this issue by allowing you to selectively disable compatibility with RFC 2328.

Use the **no** variant of this command to disable RFC 1583 compatibility.

Syntax compatible rfc1583
no compatible rfc1583

Mode Router Configuration

Example awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# compatible rfc1583

debug ospf events

Overview This command enables OSPF debugging for OSPF event troubleshooting.

To enable all debugging options, specify **debug ospf event** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF debugging. Use this command without parameters to disable all the options.

Syntax debug ospf events [abr] [asbr] [lsa] [nssa] [os] [router]
[vlink]
no debug ospf events [abr] [asbr] [lsa] [nssa] [os] [router]
[vlink]

Parameter	Description
abr	Shows ABR events.
asbr	Shows ASBR events.
lsa	Shows LSA events.
nssa	Shows NSSA events.
os	Shows OS interaction events.
router	Shows other router events.
vlink	Shows virtual link events.

Mode Privileged Exec and Global Configuration

Example awplus# debug ospf events asbr lsa

Related commands [terminal monitor](#)
[undebug ospf events](#)

debug ospf ifsm

Overview This command specifies debugging options for OSPF Interface Finite State Machine (IFSM) troubleshooting.

To enable all debugging options, specify **debug ospf ifsm** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF IFSM debugging. Use this command without parameters to disable all the options.

Syntax debug ospf ifsm [status] [events] [timers]
no debug ospf ifsm [status] [events] [timers]

Parameter	Description
events	Displays IFSM event information.
status	Displays IFSM status information.
timers	Displays IFSM timer information.

Mode Privileged Exec and Global Configuration

Example awplus# no debug ospf ifsm events status
awplus# debug ospf ifsm status
awplus# debug ospf ifsm timers

Related commands [terminal monitor](#)
[undebug ospf ifsm](#)

debug ospf lsa

Overview This command enables debugging options for OSPF Link State Advertisements (LSA) troubleshooting. This displays information related to internal operations of LSAs.

To enable all debugging options, specify **debug ospf lsa** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF LSA debugging. Use this command without parameters to disable all the options.

Syntax debug ospf lsa [flooding] [generate] [install] [maxage] [refresh]
no debug ospf lsa [flooding] [generate] [install] [maxage] [refresh]

Parameter	Description
flooding	Displays LSA flooding.
generate	Displays LSA generation.
install	Show LSA installation.
maxage	Shows maximum age of the LSA in seconds.
refresh	Displays LSA refresh.

Mode Privileged Exec and Global Configuration

Examples awplus# undebug ospf lsa refresh

Output The following shows typical output.

Example output from the debug ospf lsa command

```
2002/05/09 14:08:11 OSPF: LSA[10.10.10.10:10.10.10.70]: instance(0x8139cd0)
created with Link State Update
2002/05/09 14:08:11 OSPF: RECV[LS-Upd]: From 10.10.10.70 via vlan5:10.10.10.50
(10.10.10.10 -> 224.0.0.5)
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: Begin send queue
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: # of LSAs 1, destination 224.0.0.5
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: End send queue
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: To 224.0.0.5 via vlan5:10.10.10.50
```

Related commands terminal monitor
undebug ospf lsa

debug ospf nfsm

Overview This command enables debugging options for OSPF Neighbor Finite State Machines (NFSMs).

To enable all debugging options, specify **debug ospf nfsm** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF NFSM debugging. Use this command without parameters to disable all the options.

Syntax debug ospf nfsm [events] [status] [timers]
no debug ospf nfsm [events] [status] [timers]

Parameter	Description
events	Displays NFSM event information.
status	Displays NFSM status information.
timers	Displays NFSM timer information.

Mode Privileged Exec and Global Configuration

Examples awplus# debug ospf nfsm events
awplus# no debug ospf nfsm timers
awplus# undebug ospf nfsm events

Related commands [terminal monitor](#)
[undebug ospf nfsm](#)

debug ospf nsm

Overview This command enables debugging options for the OSPF Network Service Module.

To enable both debugging options, specify **debug ospf nsm** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF NSM debugging. Use this command without parameters to disable both options.

Syntax debug ospf nsm [interface] [redistribute]
no debug ospf nsm [interface] [redistribute]

Parameter	Description
interface	Specify NSM interface information.
redistribute	Specify NSM redistribute information.

Mode Privileged Exec and Global Configuration

Examples awplus# debug ospf nsm interface
awplus# no debug ospf nsm redistribute
awplus# undebug ospf nsm interface

Related commands [terminal monitor](#)
[undebug ospf nsm](#)

debug ospf packet

Overview This command enables debugging options for OSPF packets.

To enable all debugging options, specify **debug ospf packet** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF packet debugging. Use this command without parameters to disable all options.

Syntax `debug ospf packet [dd] [detail] [hello] [ls-ack] [ls-request] [ls-update] [recv] [send]`
`no debug ospf packet [dd] [detail] [hello] [ls-ack] [ls-request] [ls-update] [recv] [send]`

Parameter	Description
dd	Specifies debugging for OSPF database descriptions.
detail	Sets the debug option to detailed information.
hello	Specifies debugging for OSPF hello packets.
ls-ack	Specifies debugging for OSPF link state acknowledgments.
ls-request	Specifies debugging for OSPF link state requests.
ls-update	Specifies debugging for OSPF link state updates.
recv	Specifies the debug option set for received packets.
send	Specifies the debug option set for sent packets.

Mode Privileged Exec and Global Configuration

Examples `awplus# debug ospf packet detail`
`awplus# debug ospf packet dd send detail`
`awplus# no debug ospf packet ls-request recv detail`
`awplus# undebug ospf packet ls-request recv detail`

Related commands [terminal monitor](#)
[undebug ospf packet](#)

debug ospf route

Overview This command enables debugging of route calculation. Use this command without parameters to turn on all the options.

To enable all debugging options, specify **debug ospf route** with no additional parameters.

The **no** and **undebug** variant of this command disable OSPF route debugging. Use this command without parameters to disable all options.

Syntax debug ospf route [ase] [ia] [install] [spf]
no debug ospf route [ase] [ia] [install] [spf]

Parameter	Description
ia	Specifies the debugging of Inter-Area route calculation.
ase	Specifies the debugging of external route calculation.
install	Specifies the debugging of route installation.
spf	Specifies the debugging of SPF calculation.

Mode Privileged Exec and Global Configuration

Examples awplus# debug ospf route
awplus# no debug ospf route ia
awplus# debug ospf route install
awplus# undebug ospf route install

Related commands [terminal monitor](#)
[undebug ospf route](#)

default-information originate

Overview This command creates a default external route into an OSPF routing domain.

When you use the **default-information originate** command to redistribute routes into an OSPF routing domain, then the system acts like an Autonomous System Boundary Router (ASBR). By default, an ASBR does not generate a default route into the OSPF routing domain.

When using this command, also specify the **route-map <route-map>** option to avoid a dependency on the default network in the routing table.

The **metric-type** is an external link type associated with the default route advertised into the OSPF routing domain. The value of the external route could be either Type 1 or 2. The default is Type 2.

The **no** variant of this command disables this feature.

Syntax `default-information originate [always]
[metric <metric>] [metric-type <1-2>] [route-map <route-map>]
no default-information originate [always] [metric] [metric-type]
[route-map]`

Parameter	Description
<code>always</code>	Used to advertise the default route regardless of whether there is a default route.
<code><metric></code>	The metric value used in creating the default route. Enter a value in the range 0 to 16777214. The default metric value is 10. The value used is specific to the protocol.
<code><1-2></code>	External metric type for default routes, either OSPF External Type 1 or Type 2 metrics. Enter the value 1 or 2.
<code>route-map</code>	Specifies to use a specific route-map.
<code><route-map></code>	The route-map name. It is a string comprised of any characters, numbers or symbols.

Mode Router Configuration

Example

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# default-information originate always
metric 23 metric-type 2 route-map myinfo
```

Related **route-map**
commands

default-metric (OSPF)

Overview This command sets default metric values for the OSPF routing protocol. The **no** variant of this command returns OSPF to using built-in, automatic metric translations, as appropriate for each routing protocol.

Syntax `default-metric <1-16777214>`
`no default-metric [<1-16777214>]`

Parameter	Description
<1-16777214>	Default metric value appropriate for the specified routing protocol.

Mode Router Configuration

Usage notes A default metric facilitates redistributing routes even with incompatible metrics. If the metrics do not convert, the default metric provides an alternative and enables the redistribution to continue. The effect of this command is that OSPF will use the same metric value for **all** redistributed routes. Use this command in conjunction with the **redistribute (OSPF)** command.

Examples

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# default-metric 100
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# no default-metric
```

Related commands **redistribute (OSPF)**

distance (OSPF)

Overview This command sets the administrative distance for OSPF routes based on the route type. Your device uses this value to select between two or more routes to the same destination from two different routing protocols. The route with the smallest administrative distance value is added to the Forwarding Information Base (FIB). See the [Route_Selection_Feature Overview and Configuration Guide](#) for more information.

Use the command **distance ospf** to set the distance for an entire category of OSPF routes, rather than the specific routes that pass an access list.

Use the command **distance <1-255>**, with no other parameter, to set the same distance for all OSPF route types.

The **no** variant of this command sets the administrative distance for all OSPF routes to the default of 110.

Syntax `distance <1-255>`
`distance ospf {external <1-255>|inter-area <1-255>|intra-area <1-255>}`
`no distance {ospf|<1-255>}`

Parameter	Description
<1-255>	Specify the Administrative Distance value for OSPF routes.
external	Sets the distance for routes from other routing domains, learned by redistribution. Specify an OSPF external distance in the range <1-255>.
inter-area	Sets the distance for all routes from one area to another area. Specify an OSPF inter-area distance in the range <1-255>.
intra-area	Sets the distance for all routes within an area. Specify an OSPF intra-area distance in the range <1-255>.

Default The default OSPF administrative distance is 110. The default Administrative Distance for each type of route (intra, inter, or external) is 110.

Mode Router Configuration

Usage notes The administrative distance rates the trustworthiness of a routing information source. The distance could be any integer from 0 to 255. A higher distance value indicates a lower trust rating. For example, an administrative distance of 255 indicates that the routing information source cannot be trusted and should be ignored.

Use this command to set the distance for an entire group of routes, rather than a specific route that passes an access list.

Examples To set the following administrative distances for route types in OSPF 100:

- 20 for inter-area routes
- 10 for intra-area routes
- 40 for external routes

use the commands:

```
awplus(config)# router ospf 100
```

```
awplus(config-router)# distance ospf inter-area 20 intra-area 10  
external 40
```

To set the administrative distance for all routes in OSPF 100 back to the default of 110, use the commands:

```
awplus(config)# router ospf 100
```

```
awplus(config-router)# no distance ospf
```

distribute-list (OSPF)

Overview Use this command to apply filtering to the transfer of routing information between OSPF and the IP route table. You can apply filtering in either direction, from OSPF to the IP route table using an **in** distribute-list or from the IP route table to OSPF using an **out** distribute-list.

The effect of an **in** filter is that some route information that OSPF has learned from LSA updates will not be installed into the IP route table. The effect of an **out** filter is that some route information that could be redistributed to OSPF will not be redistributed to OSPF. See the **Usage** section below for the distinction between the **in** and **out** distribute-lists.

The entities that are used to perform filtering are ACLs or route-maps, which match on certain attributes in the routes that are being transferred.

For information about ACLs and route maps, see the [ACL Feature Overview and Configuration Guide](#) and the [Routemaps Feature Overview and Configuration Guide](#).

The **no** variant of this command removes the configured distribute-list command entry.

Syntax `distribute-list {<access-list-name>|route-map <route-map-name>} in`
`distribute-list <access-list-name> out {connected|rip|static}`
`no distribute-list <access-list-name> in`
`no distribute-list <access-list-name> out {connected|rip|static}`

Parameter	Description
<code><access-list-name></code>	Specifies the name of the access list. The access list defines which networks are received and which are suppressed.
<code>in</code>	Indicates that this applies to incoming advertised routes.
<code>out</code>	Indicates that this applies to outgoing advertised routes.
<code><route-map-name></code>	The name of the route-map that the distribute-list applies. This defines which networks are installed in the IP route table and which networks are filtered from the IP route table.
<code>connected</code>	Specify the redistribution of connected routes.
<code>rip</code>	Specify the redistribution of RIP routes.
<code>static</code>	Specify the redistribution of static routes.

Mode Router Configuration

Usage notes There are **in** and **out** distribute-lists, which carry out different route filtering activities:

- The **in** distribute list is applied to the process of installing OSPF routes into the IP route table. The SPF calculations generate a set of routes calculated from the LSA database. By default, all of these routes become OSPF's candidate routes for inclusion into the IP route table.
- An **in** distribute-list can be used to control whether or not certain routes generated by the SPF calculation are included into the set of candidates for inclusion into the IP route table. Those routes that match **deny** entries in the distribute-list will not be considered for inclusion into the IP route table.
- The **out** distribute-list applies the process of redistributing non-OSPF routes into OSPF. If OSPF redistribution is configured, and an **out** distribute-list is also configured, then routes that match deny entries in the distribute-list will not be redistributed into OSPF.

Examples The following example shows the installation of OSPF routes into the IP route table with route map "mymap1" applied, which will process routes that have been tagged 100:

```
awplus# configure terminal
awplus(config)# route-map mymap1 permit 10
awplus(config-route-map)# match tag 100
awplus(config-route-map)# exit
awplus(config)# router ospf 100
awplus(config-router)# distribute-list route-map mymap1 in
```

Use the following commands to configure a route-map to specifically prevent OSPF from offering 192.168.1.0/24 as a candidate for inclusion into the IP route table:

```
awplus# configure terminal
awplus(config)# ip prefix-list 100 seq 5 permit 192.168.1.0/24
awplus(config)# route-map 100 deny 10
awplus(config-route-map)# match ip address prefix-list 100
awplus(config-route-map)# exit
awplus(config)# route-map 100 permit 20
awplus(config-router)# router ospf 1
awplus(config-router)# distribute-list route-map 100 in
```

Related commands [match interface](#)
[redistribute \(OSPF\)](#)
[route-map](#)

enable db-summary-opt

Overview This command enables OSPF database summary list optimization.

The **no** variant of this command disables database summary list optimization.

Syntax enable db-summary-opt
no enable db-summary-opt

Default The default setting is disabled.

Mode Router Configuration

Usage When this feature is enabled, the database exchange process is optimized by removing the LSA from the database summary list for the neighbor, if the LSA instance in the database summary list is the same as, or less recent than, the listed LSA in the database description packet received from the neighbor.

Examples To enable OSPF database summary list optimization, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf
awplus(config-router)# enable db-summary-opt
```

To disable OSPF database summary list optimization, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf
awplus(config-router)# no enable db-summary-opt
```

Validation **show running-config**
Commands

host area

Overview This command configures a stub host entry belonging to a particular area. You can use this command to advertise specific host routes in the router-LSA as stub link. Since stub host belongs to the specified router, specifying cost is optional.

The **no** variant of this command removes the host area configuration.

Syntax `host <ip-address> area <area-id> [cost <0-65535>]`
`no host <ip-address> area <area-id> [cost <0-65535>]`

Parameter	Other parameter descriptions
<code><ip-address></code>	The IPv4 address of the host, in dotted decimal notation.
<code>cost <0-65535></code>	The cost for the stub host entry.

Default By default, no host entry is configured.

Mode Router Configuration

Example `awplus# configure terminal`
`awplus(config)# router ospf 100`
`awplus(config-router)# host 172.16.10.100 area 1`
`awplus(config-router)# host 172.16.10.101 area 2 cost 10`

ip ospf authentication

Overview This command sets the authentication method used when sending and receiving OSPF packets on the current interface. The default is to use no authentication. If no authentication method is specified in this command, then plain text authentication will be used.

The **no** variant of this command disables the authentication.

Syntax `ip ospf [<ip-address>] authentication [message-digest|null]`
`no ip ospf [<ip-address>] authentication`

Parameter	Description
<ip-address>	The IP address of the interface.
message-digest	Use the message digest authentication.
null	Use no authentication. This overrides the password or message digest authentication of the interface.

Mode Interface Configuration for a VLAN interface.

Usage notes Use the **ip ospf authentication-key** command to specify a simple text password. Use the **ip ospf message-digest-key** command to specify an MD5 key.

Example To configure VLAN interface vlan2 to have no authentication, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf authentication null
```

This will override any text or MD5 authentication configured on this interface.

Related commands **ip ospf authentication-key**
area authentication
ip ospf message-digest-key

ip ospf authentication-key

Overview This command specifies an OSPF authentication password for the neighboring routers.

The **no** variant of this command removes the OSPF authentication password.

Syntax `ip ospf [<ip-address>] authentication-key [encrypted] <pswd-long>`
`no ip ospf [<ip-address>] authentication-key`

Parameter	Description
<ip-address>	The IPv4 address of the interface, in dotted decimal notation.
encrypted	The parameter encrypted means that the password that follows is in hashed form, not plain text. Only type encrypted when creating a password with this command if you are entering the hash. This parameter is intended for use in configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the password in its hashed form.
<pswd-long>	The authentication password. The string you enter at the end of the command line will be used.

Default No password specified

Mode Interface Configuration for a VLAN interface.

Usage notes This command creates a password (key) that is inserted into the OSPF header when AlliedWare Plus™ software originates routing protocol packets. Assign a separate password to each network for different interfaces. All neighboring routers on the same network with the same password exchange OSPF routing data.

The key can be used only when authentication is enabled for an area. Use the **area authentication** command to enable authentication.

Simple password authentication allows a password to be configured for each area. Configure the routers in the same routing domain with the same password.

Example To turn on authentication in area 0 and then create an authentication key named 'very secure password' on VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# network 10.10.10.0/24 area 0
awplus(config-router)# area 0 authentication
awplus(config-router)# exit
awplus(config)# interface vlan2
awplus(config-if)# ip ospf 3.3.3.3 authentication-key very
secure password
```

Related commands [area authentication](#)
[ip ospf authentication](#)

Command changes Version 5.5.4-0.1: **encrypted** parameter added

ip ospf cost

Overview This command explicitly specifies the cost of the link-state metric in a router-LSA.

The **no** variant of this command resets the interface cost to the default.

Syntax `ip ospf [<ip-address>] cost <1-65535>`
`no ip ospf [<ip-address>] cost`

Parameter	Description
<ip-address>	The IPv4 address of the interface, in dotted decimal notation.
<1-65535>	The link-state metric.

Default No static value. The OSPF cost is automatically calculated by using the **auto-cost reference bandwidth**.

Mode Interface Configuration for a VLAN interface.

Usage notes This command explicitly sets a user specified cost of sending packets out the interface. Using this command overrides the cost value calculated automatically with the auto-cost reference bandwidth feature.

The interface cost indicates the overhead required to send packets across a certain interface. This cost is stated in the Router-LSA's link. Typically, the cost is inversely proportional to the bandwidth of an interface. By default, the cost of an interface is calculated according to the following formula:

- $\text{reference bandwidth} / \text{interface bandwidth}$

Use the **ip ospf cost** command to set the interface cost manually.

Example To set the OSPF cost to 10 on VLAN interface vlan25 for IP address 10.10.10.50, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan25
awplus(config-if)# ip ospf 10.10.10.50 cost 10
```

Related commands **show ip ospf interface**
auto-cost reference bandwidth

ip ospf database-filter

Overview This command turns on the LSA database-filter for a particular interface. The **no** variant of this command turns off the LSA database-filter.

Syntax `ip ospf [<ip-address>] database-filter all out`
`no ip ospf [<ip-address>] database-filter`

Parameter	Description
<ip-address>	The IPv4 address of the interface, in dotted decimal notation.

Default All outgoing LSAs are flooded to the interface.

Mode Interface Configuration for a VLAN interface.

Usage notes OSPF floods new LSAs over all interfaces in an area, except the interface on which the LSA arrives. This redundancy ensures robust flooding. However, too much redundancy can waste bandwidth and might lead to excessive link and CPU usage in certain topologies, resulting in destabilizing the network. To avoid this, use the **ip ospf database-filter** command to block flooding of LSAs over specified interfaces.

Example To stop flooding new LSAs on the VLAN interface vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if# ip ospf database-filter all out
```

ip ospf dead-interval

Overview This command sets the interval during which no hello packets are received and after which a neighbor is declared dead.

The dead-interval is the amount of time that OSPF waits to receive an OSPF hello packet from the neighbor before declaring the neighbor is down. This value is advertised in the router's hello packets. It must be a multiple of the hello-interval and be the same for all routers on a specific network.

The **no** variant of this command returns the interval to the default of 40 seconds. If you have configured this command specifying the IP address of the interface and want to remove the configuration, specify the IP address (**no ip ospf <ip-address> dead-interval**).

Syntax ip ospf [<ip-address>] dead-interval <1-65535>
no ip ospf [<ip-address>] dead-interval

Parameter	Description
<ip-address>	The IPv4 address of the interface, in dotted decimal notation.
<1-65535>	The interval in seconds. Default: 40

Mode Interface Configuration for a VLAN interface.

Example To set the dead-interval to 10 seconds on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf dead-interval 10
```

Related commands [ip ospf hello-interval](#)
[show ip ospf interface](#)

ip ospf disable all

Overview This command completely disables OSPF packet processing on an interface. It overrides the **network area** command and disables the processing of packets on the specific interface.

Use the **no** variant of this command to restore OSPF packet processing on a selected interface.

Syntax ip ospf disable all
no ip ospf disable all

Mode Interface Configuration for a VLAN interface.

Example To disable OSPF packet processing on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf disable all
```

ip ospf hello-interval

Overview This command specifies the interval between hello packets.

The hello-interval is advertised in the hello packets. Configure the same hello-interval for all routers on a specific network. A shorter hello interval ensures faster detection of topological changes, but results in more routing traffic.

The **no** variant of this command returns the interval to the default of 10 seconds.

Syntax `ip ospf [<ip-address>] hello-interval <1-65535>`
`no ip ospf [<ip-address>] hello-interval`

Parameter	Description
<ip-address>	The IP address of the interface, in dotted decimal notation.
<1-65535>	The interval in seconds. Default: 10

Default 10 seconds

Mode Interface Configuration for a VLAN interface.

Example To set the hello-interval to 3 seconds on VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf hello-interval 3
```

Related commands [ip ospf dead-interval](#)
[show ip ospf interface](#)

ip ospf message-digest-key

Overview This command registers an MD5 key for OSPF MD5 authentication.

Message Digest Authentication is a cryptographic authentication. A key (password) and key-id are configured on each router. The router uses an algorithm based on the OSPF packet, the key, and the key-id to generate a message digest that gets appended to the packet.

The **no** variant of this command removes the MD5 key.

Syntax `ip ospf [<ip-address>] message-digest-key <key-id> md5
[encrypted] <pswd-long>
no ip ospf [<ip-address>] message-digest-key <key-id>`

Parameter	Description
<ip-address>	The IPv4 address of the interface, in dotted decimal notation.
<key-id>	A key ID number specified as an integer between 1 and 255.
md5	Use the MD5 algorithm.
encrypted	The parameter encrypted means that the password that follows is in hashed form, not plain text. Only type encrypted when creating a password with this command if you are entering the hash. This parameter is intended for use in configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the password in its hashed form.
<pswd-long>	The OSPF password. This is a string of 1 to 16 characters including spaces.

Default No MD5 key registered

Mode Interface Configuration for a VLAN interface.

Usage notes Use this command for uninterrupted transitions between passwords. It allows you to add a new key without having to delete the existing key. While multiple keys exist, all OSPF packets will be transmitted in duplicate; one copy of the packet will be transmitted for each of the current keys. This is helpful for administrators who want to change the OSPF password without disrupting communication. The system begins a rollover process until all the neighbors have adopted the new password. This allows neighboring routers to continue communication while the network administrator is updating them with a new password. The router will stop sending duplicate packets once it detects that all of its neighbors have adopted the new password.

Maintain only one password per interface, removing the old password whenever you add a new one. This will prevent the local system from continuing to communicate with the system that is using the old password. Removing the old password also reduces overhead during rollover. All neighboring routers on the same network must have the same password value to enable exchange of OSPF routing data.

Examples To configure OSPF authentication on the VLAN interface vlan5, with a key of 'yourpass', use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan5
awplus(config-if)# ip ospf authentication message-digest
awplus(config-if)# ip ospf message-digest-key 1 md5 yourpass
```

To configure OSPF authentication on the VLAN interface vlan2 for the IP address 1.1.1.1, with a key of 'yourpass', use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf 1.1.1.1 authentication message-digest
awplus(config-if)# ip ospf 1.1.1.1 message-digest-key 2 md5
yourpass
```

This means that if the interface has multiple IP addresses assigned (e.g. 1.1.1.1 & 2.2.2.2), OSPF authentication will be enabled only for the IP address 1.1.1.1.

Command changes Version 5.5.4-0.1: **encrypted** parameter added

ip ospf mtu

Overview This command sets the MTU size for OSPF. Whenever OSPF constructs packets, it uses the interface MTU size as Maximum IP packet size. This command forces OSPF to use the specified value, instead of the actual interface MTU size.

Use the **no** variant of this command to return the MTU size to the default.

Syntax `ip ospf mtu <mtu-size>`
`no ip ospf mtu`

Parameter	Description
<mtu-size>	<576 - 65535> The MTU size in bytes.

Default OSPF uses the interface MTU derived from the interface

Mode Interface Configuration for a VLAN interface.

Usage notes This command allows an administrator to configure the MTU size recognized by the OSPF protocol. It does not configure the MTU settings on the interface.

This command can be useful to ensure the OSPF neighbor relationship can fully establish via a network link, where the neighboring devices may have mismatched interface MTUs.

Example To change the OSPF MTU to 1446 on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf mtu 1446
```

ip ospf mtu-ignore

Overview Use this command to configure OSPF so that OSPF does not check the MTU size during DD (Database Description) exchange.

Use the **no** variant of this command to make sure that OSPF checks the MTU size during DD exchange.

Syntax `ip ospf [<ip-address>] mtu-ignore`
`no ip ospf [<ip-address>] mtu-ignore`

Parameter	Description
<code><ip-address></code>	The IPv4 address of the interface, in dotted decimal notation.

Mode Interface Configuration for a VLAN interface.

Usage notes By default, during the DD exchange process, OSPF checks the MTU size described in the DD packets received from the neighbor. If the MTU size does not match the interface MTU, the neighbor adjacency is not established. Using this command makes OSPF ignore this check and allows establishing of adjacency regardless of MTU size in the DD packet.

Example To stop OSPF from checking the MTU size during DD exchange on the VLAN interface `vlan2`, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf mtu-ignore
```

ip ospf network

Overview This command configures the OSPF network type to a type different from the default for the particular interface.

The **no** variant of this command returns the network type to the default for the particular interface.

Syntax `ip ospf network {broadcast|non-broadcast|point-to-point| point-to-multipoint}`
`no ip ospf network`

Parameter	Description
broadcast	Sets the network type to broadcast.
non-broadcast	Sets the network type to NBMA.
point-to-multipoint	Sets the network type to point-to-multipoint.
point-to-point	Sets the network type to point-to-point.

Default The default is the default type for the interface, e.g broadcast for VLANs.

Mode Interface Configuration for a VLAN interface.

Usage notes This command forces the interface network type to be the specified type. Depending on the network type, OSPF changes the behavior of the packet transmission and the link description in LSAs.

Example The following example shows setting the network type to point-to-point on the VLAN interface vlan1:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip ospf network point-to-point
```

ip ospf priority

Overview This command sets the router priority, which is a parameter used in the election of the designated router for the network.

The **no** variant of this command returns the router priority to the default of 1.

Syntax ip ospf [<ip-address>] priority <priority>
no ip ospf [<ip-address>] priority

Parameter	Description
<ip-address>	The IP address of the interface.
<priority>	<0-255> The Router Priority of the interface.

Default 1

Mode Interface Configuration for a VLAN interface.

Usage notes Set the priority to help determine the OSPF Designated Router (DR) for a network. If two routers attempt to become the DR, the router with the higher router priority becomes the DR. If the router priority is the same for two routers, the router with the higher router ID takes precedence.

Only routers with nonzero router priority values are eligible to become the designated or backup designated router.

Configure router priority for multi-access networks only and not for point-to-point networks.

Example To set the OSPF priority value to 3 on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf priority 3
```

Related commands [ip ospf network](#)

ip ospf resync-timeout

Overview Use this command to set the interval after which adjacency is reset if out-of-band resynchronization has not occurred. The interval period starts from the time a restart signal is received from a neighbor.

Use the **no** variant of this command to return to the default.

Syntax `ip ospf [<ip-address>] resync-timeout <1-65535>`
`no ip ospf [<ip-address>] resync-timeout`

Parameter	Description
<ip-address>	The IP address of the interface.
<1-65535>	The resynchronization timeout value of the interface in seconds.

Mode Interface Configuration for a VLAN interface.

Example To set the OSPF resynchronization timeout value to 65 seconds on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf resync-timeout 65
```

ip ospf retransmit-interval

Overview Use this command to specify the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface.

Use the **no** variant of this command to return to the default of 5 seconds.

Syntax `ip ospf [<ip-address>] retransmit-interval <1-65535>`
`no ip ospf [<ip-address>] retransmit-interval`

Parameter	Description
<ip-address>	The IP address of the interface.
<1-65535>	The interval in seconds.

Default 5 seconds

Mode Interface Configuration for a VLAN interface.

Usage notes After sending an LSA to a neighbor, the router keeps the LSA until it receives an acknowledgment. In case the router does not receive an acknowledgment during the set time (the retransmit interval value) it retransmits the LSA. Set the retransmission interval value conservatively to avoid needless retransmission. The interval should be greater than the expected round-trip delay between two routers.

Example To set the retransmit interval to 6 seconds on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf retransmit-interval 6
```

ip ospf transmit-delay

Overview Use this command to set the estimated time it takes to transmit a link-state-update packet on the interface.

Use the **no** variant of this command to return to the default of 1 second.

Syntax `ip ospf [<ip-address>] transmit-delay <1-65535>`
`no ip ospf [<ip-address>] transmit-delay`

Parameter	Description
<ip-address>	The IP address of the interface.
<1-65535>	The time, in seconds, to transmit a link-state update.

Default 1 second

Mode Interface Configuration for a VLAN interface.

Usage notes The transmit delay value adds a specified time to the age field of an update. If the delay is not added, the time in which the LSA transmits over the link is not considered. This command is especially useful for low speed links. Add transmission and propagation delays when setting the transmit delay value.

Example To set the OSPF transmit delay time to 3 seconds on the VLAN interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip ospf transmit-delay 3
```

max-concurrent-dd

Overview Use this command to set the limit for the number of Database Descriptors (DD) that can be processed concurrently.

Use the **no** variant of this command to reset the limit for the number of Database Descriptors (DD) that can be processed concurrently.

Syntax max-concurrent-dd <1-65535>
no max-concurrent-dd

Parameter	Description
<1-65535>	Specify the number of DD processes.

Mode Router Configuration

Usage This command is useful when a router's performance is affected from simultaneously bringing up several OSPF adjacencies. This command limits the maximum number of DD exchanges that can occur concurrently per OSPF instance, thus allowing for all of the adjacencies to come up.

Example The following example sets the max-concurrent-dd value to 4, so that only 4 DD exchanges will be processed at a time.

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router# max-concurrent-dd 4
```

maximum-area

Overview Use this command to set the maximum number of OSPF areas.

Use the **no** variant of this command to set the maximum number of OSPF areas to the default.

Syntax maximum-area <1-4294967294>
no maximum-area

Parameter	Description
<1-4294967294>	Specify the maximum number of OSPF areas.

Default The default for the maximum number of OSPF areas is 4294967294.

Mode Router Configuration

Usage notes Use this command in router OSPF mode to specify the maximum number of OSPF areas.

Examples The following example sets the maximum number of OSPF areas to 2:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# maximum-area 2
```

The following example removes the maximum number of OSPF areas and resets to default:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# no maximum-area
```

neighbor (OSPF)

Overview Use this command to inform the router of other neighboring routers that are connected to the same Non-Broadcast Multiple Access (NBMA) network.

Use the **no** variant of this command to remove a configuration.

Syntax `neighbor <ip-address> [<cost>] {<priority>|<poll-interval>}`
`no neighbor <ip-address> [<cost>] {<priority>|<poll-interval>}`

Parameter	Description
<code><ip-address></code>	Specifies the interface IP address of the neighbor.
<code><priority></code>	<i>priority <0-255></i> Specifies the router priority value of the non-broadcast neighbor associated with the specified IP address. The default is 0. This keyword does not apply to point-to-multipoint interfaces.
<code><poll-interval></code>	<i>poll-interval <1-2147483647></i> Dead neighbor polling interval in seconds. It is recommended to set this value much higher than the hello interval. The default is 120 seconds.
<code><cost></code>	<i>cost <1-65535></i> Specifies the link-state metric to this neighbor.

Mode Router Configuration

Usage To configure a neighbor on an NBMA network manually, use the **neighbor** command and include one neighbor entry for each known non broadcast network neighbor. The IP address used in this command is the neighbor's primary IP address on the interface where that neighbor connects to the NBMA network.

The poll interval is the reduced rate at which routers continue to send hello packets, when a neighboring router has become inactive. Set the poll interval to be much larger than hello interval.

Examples This example shows a neighbor configured with a priority value, poll interval time, and cost:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# neighbor 1.2.3.4 priority 1 poll-interval
90
awplus(config-router)# neighbor 1.2.3.4 cost 15
```

network area

Overview Use this command to enable OSPF routing with a specified Area ID on any interfaces with IP addresses that match the specified network address.

Use the **no** variant of this command to disable OSPF routing on the interfaces.

Syntax network <network-address> area <area-id>
no network <network-address> area <area-id>

Parameter	Other parameter descriptions
<network-address>	{<ip-network/m>|<ip-addr> <reverse-mask>}
<ip-network/m>	IP address of the network, entered in the form A.B.C.D/M. Dotted decimal notation followed by a forward slash, and then the subnet mask length.
<ip-addr> <reverse-mask>	IPv4 network address, entered in the form A.B.C.D, followed by the mask. Enter the mask as a wildcard, or reverse, mask (e.g. 0.0.0.255). Note that the device displays the mask as a subnet mask in the running configuration.

Default No **network area** is configured by default.

Mode Router Configuration

Usage notes OSPF routing can be enabled per IPv4 subnet. The network address can be defined using either the prefix length or a wild card mask. A wild card mask is comprised of consecutive 0's as network bits and consecutive 1's as host bits.

Examples The following commands show the use of the **network area** command with OSPF multiple instance support disabled:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# network 10.0.0.0/8 area 3
awplus(config-router)# network 10.0.0.0/8 area 1.1.1.1
```

The following commands disable OSPF routing with Area ID 3 on all interfaces:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# no network 10.0.0.0/8 area3
```

ospf abr-type

Overview Use this command to set an OSPF Area Border Router (ABR) type.

Use the **no** variant of this command to revert the ABR type to the default setting.

Syntax ospf abr-type {cisco|ibm|standard}
no ospf abr-type [cisco|ibm|standard]

Parameter	Description
cisco	Specifies an alternative ABR using Cisco implementation (RFC 3509). This is the default ABR type.
ibm	Specifies an alternative ABR using IBM implementation (RFC 3509).
standard	Specifies a standard behavior ABR (RFC 2328).

Default ABR type cisco

Mode Router Configuration

Usage Specifying the ABR type allows better interoperation between different implementations. This command is specially useful in a multi-vendor environment. The different ABR types are:

- Cisco ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and one of them is the backbone area.
- IBM ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and the backbone area is configured. In this case the configured backbone need not be actively connected.
- Standard ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached to it.

Example To configure the ABR type as **ibm**, use the following commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# ospf abr-type ibm
```

ospf restart grace-period

Overview Use this command to configure the grace-period for restarting OSPF routing.

Use the **no** variant of this command to revert to the default grace-period.

Syntax ospf restart grace-period <1-1800>
no ospf restart grace-period

Parameter	Description
<1-1800>	Specifies the grace period in seconds.

Default In the AlliedWare Plus™ OSPF implementation, the default OSPF grace-period is 180 seconds.

Mode Global Configuration

Usage notes Use this command to enable the OSPF Graceful Restart feature and set the restart grace-period. Changes from the default restart grace-period are displayed in the running- config. The restart grace-period is not displayed in the running-config if it has been reset to the default using the **no** variant of this command.

When a master failover happens on a VCStack, the grace-period will be the longer of the default value (180 seconds) and the configured value from this command. Therefore, the configured grace-period value will only be used in a master failover if it is longer than 180 seconds.

Example To set the OSPF restart grace-period to 250 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ospf restart grace-period 250
```

To reset the OSPF restart grace-period to the default (180 seconds), use the commands:

```
awplus# configure terminal
awplus(config)# no ospf restart grace-period
```

Validation Commands **show running-config**

Related commands **ospf restart helper**
restart ospf graceful

ospf restart helper

Overview Use this command to configure the **helper** behavior for the OSPF Graceful Restart feature.

Use the **no** variant of this command to revert to the default grace-period.

Syntax `ospf restart helper {max-grace-period <grace-period>|only-reload|only-upgrade}`
`ospf restart helper {never router-id <router-id>}`
`no ospf restart helper [max-grace-period]`

Parameter	Description
max-grace-period	Specify help if received grace-period is less than a specified value.
<grace-period>	Maximum grace period accepted in seconds in range <1- 1800>.
never	Specify the local policy to never to act as a helper for this feature.
only-reload	Specify help only on software reloads not software upgrades.
only-upgrade	Specify help only on software upgrades not software reloads.
router-id	Enter the router-id keyword to specify the OSPF Router ID that is never to act as a helper for the OSPF Graceful Restart feature.
<router-id>	<A.B.C.D> Specify the OSPF Router ID in dotted decimal format A.B.C.D

Default In the AlliedWare Plus™ OSPF implementation, the default OSPF grace-period is 180 seconds.

Mode Global Configuration

Usage The **ospf restart helper** command requires at least one parameter, but you may use more than one in the same command (excluding parameter **never**).

The **no** version of this command turns off the OSPF restart helper, while the **no ospf restart helper max-grace-period** command resets the max-grace-period, rather than the helper policy itself.

Example awplus# configure terminal
awplus(config)# ospf restart helper only-reload
awplus# configure terminal
awplus(config)# ospf restart helper never router-id 10.10.10.1
awplus# configure terminal
awplus(config)# no ospf restart helper max-grace-period

Related commands **ospf restart grace-period**
restart ospf graceful

ospf router-id

Overview Use this command to specify a router ID for the OSPF process.
Use the **no** variant of this command to disable this function.

Syntax ospf router-id *<ip-address>*
no ospf router-id

Parameter	Description
<i><ip-address></i>	Specifies the router ID in IPv4 address format.

Mode Router Configuration

Usage Configure each router with a unique router-id. In an OSPF router process that has active neighbors, a new router-id takes effect at the next reload or when you restart OSPF manually.

Example The following example shows a specified router ID 2.3.4.5.

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# ospf router-id 2.3.4.5
```

Related commands [show ip ospf](#)

overflow database

Overview Use this command to limit the maximum number of Link State Advertisements (LSAs) that can be supported by the current OSPF instance.

Use the **no** variant of this command to have no limit on the maximum number of LSAs.

Syntax overflow database <0-4294967294> {hard|soft}
no overflow database

Parameter	Description
<0-4294967294>	The maximum number of LSAs.
hard	Shutdown occurs if the number of LSAs exceeds the specified value.
soft	Warning message appears if the number of LSAs exceeds the specified value.

Mode Router Configuration

Usage Use **hard** with this command if a shutdown is required if the number of LSAs exceeds the specified number. Use **soft** with this command if a shutdown is not required, but a warning message is required, if the number of LSAs exceeds the specified number.

Example The following example shows setting the database overflow to 500, and a shutdown to occur, if the number of LSAs exceeds 500.

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# overflow database 500 hard
```

overflow database external

Overview Use this command to configure the size of the external database and the time the router waits before it tries to exit the overflow state.

Use the **no** variant of this command to revert to default.

Syntax `overflow database external <max-lsas> <recover-time>`
`no overflow database external`

Parameter	Description
<code><max-lsas></code>	<code><0-2147483647></code> The maximum number of Link State Advertisements (LSAs). Note that this value should be the same on all routers in the AS.
<code><recover-time></code>	<code><0-65535></code> the number of seconds the router waits before trying to exit the database overflow state. If this parameter is 0, router exits the overflow state only after an explicit administrator command.

Mode Router Configuration

Usage Use this command to limit the number of AS-external-LSAs a router can receive, once it is in the wait state. It takes the number of seconds specified as the `<recover-time>` to recover from this state.

Example The following example shows setting the maximum number of LSAs to 5 and the time to recover from overflow state to be 3:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# overflow database external 50 3
```


passive-interface (OSPF)

Overview Use this command to suppress the sending of Hello packets on all interfaces, or on a specified interface. If you use the **passive-interface** command without the optional parameters then all interfaces are put into passive mode.

Use the **no** variant of this command to allow the sending of Hello packets on all interfaces, or on the specified interface. If you use the **no** variant of this command without the optional parameters then all interfaces are removed from passive mode.

Syntax `passive-interface [<interface>] [<ip-address>]`
`no passive-interface [<interface>] [<ip-address>]`

Parameter	Description
<code><interface></code>	The name of the interface.
<code><ip-address></code>	IP address of the interface, entered in the form A.B.C.D.

Mode Router Configuration

Usage notes Configure an interface to be passive if you wish its connected route to be treated as an OSPF route (rather than an AS-external route), but do not wish to actually exchange any OSPF packets via this interface.

Examples To configure passive interface mode on all interfaces, enter the following commands:

```
awplus(config)# router ospf 100
awplus(config-router)# passive-interface
```

To configure passive interface mode on the local loopback interface, enter the following commands:

```
awplus(config)# router ospf 100
awplus(config-router)# passive-interface lo
```

To remove passive interface mode on all interfaces, enter the following commands:

```
awplus(config)# router ospf 100
awplus(config-router)# no passive-interface
```

redistribute (OSPF)

Overview Use this command to redistribute routes from other routing protocols, static routes and connected routes into an OSPF routing table.

Use the **no** variant of this command to disable this function.

Syntax redistribute {connected|rip|static} {metric <0-16777214>|metric-type {1|2}|route-map <name>|tag <0-4294967295>}
no redistribute {connected|rip|static} {metric <0-16777214>|metric-type {1|2}|route-map <name>|tag <0-4294967295>}

Parameter	Description
connected	Specifies that this applies to the redistribution of connected routes.
rip	Specifies that this applies to the redistribution of RIP routes.
static	Specifies that this applies to the redistribution of static routes.
metric	Specifies the external metric.
metric-type	Specifies the external metric-type.
route-map	Specifies name of the route-map.
tag	Specifies the external route tag.

Default The default metric value for routes redistributed into OSPF is 20. The metric can also be defined using the **set metric** command for a route map. Note that a metric defined using the **set metric** command for a route map overrides a metric defined with this command.

Mode Router Configuration

Usage notes You use this command to inject routes, learned from other routing protocols, into the OSPF domain to generate AS-external-LSAs. If a route-map is configured by this command, then that route-map is used to control which routes are redistributed and can set metric and tag values on particular routes.

The metric, metric-type, and tag values specified on this command are applied to any redistributed routes that are not explicitly given a different metric, metric-type, or tag value by the route map.

See the [OSPF Feature Overview and Configuration Guide](#) for more information about metrics, and about behavior when configured in route maps.

Note that this command does not redistribute the default route. To redistribute the default route, use the [default-information originate](#) command.

Example The following example shows the configuration of a route-map named 'rmap2', which is then applied using the **redistribute route-map** command, so routes learned via a specified interface can be redistributed as type-1 external LSAs:

```
awplus# configure terminal
awplus(config)# route-map rmap2 permit 3
awplus(config-route-map)# match interface vlan1
awplus(config-route-map)# set metric-type 1
awplus(config-route-map)# exit
awplus(config)# router ospf 100
awplus(config-router)# redistribute rip route-map rmap2
```

Note that configuring a route-map and applying it with the **redistribute route-map** command allows you to filter which routes are distributed from another routing protocol (such as RIP). A route-map can also set the metric, tag, and metric-type of the redistributed routes.

Related commands [distribute-list \(OSPF\)](#)
[match interface](#)
[route-map](#)
[show ip ospf database external](#)

restart ospf graceful

Overview Use this command to force the OSPF process to restart, and optionally set the grace-period.

Syntax `restart ospf graceful [grace-period <1-1800>]`

Parameter	Description
grace-period	Specify the grace period.
<1-1800>	The grace period in seconds.

Default In the AlliedWare Plus™ OSPF implementation, the default OSPF grace-period is 180 seconds.

Mode Privileged Exec

Usage notes After this command is executed, the OSPF process immediately shuts down. It notifies the system that OSPF has performed a graceful shutdown. Routes installed by OSPF are preserved until the grace-period expires.

When a **restart ospf graceful** command is issued, the OSPF configuration is reloaded from the last saved configuration. Ensure you first enter the command **copy running-config startup-config**.

When a master failover happens on a VCStack, the grace-period will be the longer of the default value (180 seconds) and the configured value from this command. Therefore, the configured grace-period value will only be used in a master failover if it is longer than 180 seconds.

Example

```
awplus# copy running-config startup-config
awplus# restart ospf graceful grace-period 200
```

Related commands [ospf restart grace-period](#)
[ospf restart helper](#)

router ospf

Overview Use this command to enter Router Configuration mode to configure an OSPF routing process. You must specify the process ID with this command for multiple OSPF routing processes on the device.

Use the **no** variant of this command to terminate an OSPF routing process.

Use the **no** parameter with the **process-id** parameter, to terminate and delete a specific OSPF routing process. If no **process-id** is specified on the **no** variant of this command, then all OSPF routing processes are terminated, and all OSPF configuration is removed.

Syntax router ospf [*<process-id>*]
no router ospf [*<process-id>*]

Parameter	Description
<i><process-id></i>	A positive number from 1 to 65535, that is used to define a routing process.

Default No routing process is defined by default.

Mode Global Configuration

Usage notes The process ID of OSPF is an optional parameter for the **no** variant of this command only. When removing all instances of OSPF, you do not need to specify each Process ID, but when removing particular instances of OSPF you must specify each Process ID to be removed.

Example To enter Router Configuration mode to configure an existing OSPF routing process 100, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)#
```

router-id

Overview Use this command to specify a router ID for the OSPF process.

Use the **no** variant of this command to force OSPF to use the previous OSPF router-id behavior.

Syntax router-id <ip-address>
no router-id

Parameter	Description
<ip-address>	Specifies the router ID in IPv4 address format.

Mode Router Configuration

Usage Configure each router with a unique router-id. In an OSPF router process that has active neighbors, a new router-id is used at the next reload or when you restart OSPF manually.

Example The following example shows a fixed router ID 10.10.10.60

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# router-id 10.10.10.60
```

Related commands [show ip ospf](#)

service ospf

Overview Use this command to enable the OSPF service.

Use the **no** version of the command to disable the OSPF service if you are not using it.

Syntax service ospf
no service ospf

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using OSPF. Enable it before configuring OSPF.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the OSPF service, use the commands:

```
awplus# configure terminal
awplus(config)# service ospf
```

To disable the OSPF service, use the commands:

```
awplus# configure terminal
awplus(config)# no service ospf
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show debugging ospf

Overview Use this command to see what debugging is turned on for OSPF.
For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging ospf

Mode User Exec and Privileged Exec

Example awplus# show debugging ospf

Output The following shows typical output.

Example output from the show debugging ospf command

```
OSPF debugging status:
  OSPF packet Link State Update debugging is on
  OSPF all events debugging is on
```


show ip ospf

Overview Use this command to display general information about all OSPF routing processes. Include the **ospf-id** parameter with this command to display information about specified instances.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf
show ip ospf *<ospf-id>*

Parameter	Description
<i><ospf-id></i>	<i><0-65535></i> The ID of the router process for which information will be displayed. If this parameter is included, only the information for this specified routing process is displayed.

Mode User Exec and Privileged Exec

Examples To display general information about all OSPF routing processes, use the command:

```
awplus# show ip ospf
```

To display general information about OSPF routing process 100, use the command:

```
awplus# show ip ospf 100
```

Example output from the show ip ospf command

```
Route Licence: Route : Limit=0, Allocated=0, Visible=0, Internal=0
Route Licence: Breach: Current=0, Watermark=0
Routing Process "ospf 10" with ID 192.168.1.1
Process uptime is 10 hours 24 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583 Compatibility flag is disabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Graceful Restart

SPF schedule delay min 0.500 secs, SPF schedule delay max 50.0 secs
Refresh timer 10 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum 0x000000
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 0

External LSA database is unlimited.
Number of LSA originated 0
Number of LSA received 0
Number of areas attached to this router: 2
  Area 0 (BACKBONE) (Inactive)
    Number of interfaces in this area is 0(0)
    Number of fully adjacent neighbors in this area is 0
    Area has no authentication
    SPF algorithm executed 0 times
    Number of LSA 0. Checksum 0x000000

  Area 1 (Inactive)
    Number of interfaces in this area is 0(0)
    Number of fully adjacent neighbors in this area is 0
    Number of fully adjacent virtual neighbors through this area is 0
    Area has no authentication
    SPF algorithm executed 0 times
    Number of LSA 0. Checksum 0x000000
```

Example output from the show ip ospf <ospf-id> command

```
Routing Process "ospf 100" with ID 10.10.11.146
Process uptime is 0 minute
Conforms to RFC2328, and RFC1583Compatibility flag is disabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Refresh timer 10 secs
Number of external LSA 0. Checksum Sum 0x0
Number of non-default external LSA 0
External LSA database is unlimited.
Number of areas attached to this router: 1
  Area 1
    Number of interfaces in this area is 1(1)
    Number of fully adjacent neighbors in this area is 0
    Number of fully adjacent virtual neighbors through this area is 0
    Area has no authentication
```

SPF algorithm executed 0 times
Number of LSA 1. Checksum Sum 0x00e3e2

Parameters in the output of the show ip ospf command

Output Parameter		Meaning
Route Licence: Route:	Limit	The maximum number of OSPF routes which may be used for forwarding.
	Allocated	The current total number of OSPF routes allocated in the OSPF module.
	Visible	The current number of OSPF routes which may be used for forwarding.
	Internal	The number of OSPF internal routes used for calculating paths to ASBRs.
Number of external LSA		The number of external link-state advertisements
Number of opaque AS LSA		Number of opaque link-state advertisements

Related [router ospf](#)
commands

show ip ospf border-routers

Overview Use this command to display the ABRs and ASBRs for all OSPF instances. Include the **ospf-id** parameter with this command to display information about specified instances.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf border-routers
show ip ospf <ospf-id> border-routers

Parameter	Description
<ospf-id>	<0-65535> The ID of the router process for which information will be displayed. If this parameter is included, only the information for this specified routing process is displayed.

Mode User Exec and Privileged Exec

Examples To display the ABRs and ASBRs for all OSPF instances, use the following command:

```
awplus# show ip ospf border-routers
```

Output The following shows typical output.

Example output from the show ip ospf border-routers command

```
OSPF process 1 internal Routing Table
Codes: i - Intra-area route, I - Inter-area route
i 10.15.0.1 [10] via 10.10.0.1, vlan2, ASBR, Area 0.0.0.0
i 172.16.10.1 [10] via 10.10.11.50, vlan3, ABR, ASBR, Area
0.0.0.0
...
```

show ip ospf database

Overview Use this command to display a database summary for OSPF information. Include the *process-id* parameter with this command to display information about specified instances.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip ospf [*<process-id>*] database [self-originate|max-age|adv-router *<adv-router-id>*]

Parameter	Description
<i><process-id></i>	<i><0-65535></i> The ID of the router process for which information will be displayed.
self-originate	Displays self-originated link states.
max-age	Displays LSAs in MaxAge list. It maintains the list of the all LSAs in the database which have reached the max-age which is 3600 seconds.
adv-router <i><adv-router-id></i>	Displays all the LSAs of the specified router. The Advertising Router ID <i><adv-router-id></i> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ipospf database
awplus# show ip ospf database self-originate

Output The following shows typical output.

Example output from the show ip ospf database command

OSPF Router process 1 with ID (10.10.11.60)					
Router Link States (Area 0.0.0.1)					
Link ID	ADV Router	Age	Seq#	CkSum	Link
count					
10.10.11.60	10.10.11.60	32	0x800000002	0x472b	1
OSPF Router process 100 with ID (10.10.11.60)					
Router Link States (Area 0.0.0.0)					
Link ID	ADV Router	Age	Seq#	CkSum	Link
count					
10.10.11.60	10.10.11.60	219	0x800000001	0x4f5d	0

Example output from the show ip ospf database self-originate command

OSPF Router process 100 with ID (10.10.11.50)					
Router Link States (Area 0.0.0.1 [NSSA])					
Link ID	ADV Router	Age	Seq#	CkSum	Link
count					
10.10.11.50	10.10.11.50	20	0x800000007	0x65c3	2
Area-Local Opaque-LSA (Area 0.0.0.1 [NSSA])					
Link ID	ADV Router	Age	Seq#	CkSum	Opaque ID
67.1.4.217	10.10.11.50	37	0x800000001	0x2129	66777
AS-Global Opaque-LSA					
Link ID	ADV Router	Age	Seq#	CkSum	Opaque ID
67.1.4.217	10.10.11.50	37	0x800000001	0x2daa	66777

show ip ospf database asbr-summary

Overview Use this command to display information about the Autonomous System Boundary Router (ASBR) summary LSAs.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus”_Feature Overview and Configuration Guide](#).

Syntax show ip ospf database asbr-summary [<ip-address>] [self-originate|adv-router <adv-router-id>]

Parameter	Description
<ip-address>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <adv-router-id>	Displays all the LSAs of the specified router. The Advertising Router ID <adv-router-id> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database asbr-summary
awplus# show ip ospf database asbr-summary self-originate
awplus# show ip ospf database asbr-summary 1.2.3.4 adv-router 2.3.4.5

show ip ospf database external

Overview Use this command to display information about the external LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ip ospf database external adv-router[<ip-address>] [self-originate|adv-router <adv-router-id>]`

Parameter	Description
<ip-address>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <adv-router-id>	Displays all the LSAs of the specified router. The Advertising Router ID <adv-router-id> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples `awplus# show ip ospf database external self-originate`
`awplus# show ip ospf database external adv-router 2.3.4.5`

Output The following shows typical output.

Example output from the show ip ospf database external self-originate command

```
OSPF Router process 100 with ID (10.10.11.50)
AS External Link States
LS age: 298
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 10.10.100.0 (External Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x7033
Length: 36
Network Mask: /24
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 20
    Forward Address: 10.10.11.50
    External Route Tag: 0
```

Example output from the show ip ospf database external adv-router 2.3.4.5 command

```
awplus#show ip ospf database external adv-router 2.3.4.5
AS External Link States
LS age: 273
Options: 0x2 (-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 172.16.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 80000004
Checksum: 0x02f8
Length: 36
Network Mask: /24
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 20
    Forward Address: 0.0.0.0
    External Route Tag: 0
```

show ip ospf database network

Overview Use this command to display information about the network LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip ospf database network [*<ip-address>*] [self-originate] adv-router *<adv-router-id>*]

Parameter	Description
<i><ip-address></i>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <i><adv-router-id></i>	Displays all the LSAs of the specified router. The Advertising Router ID <i><adv-router-id></i> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database network
awplus# show ip ospf database network self-originate
awplus# show ip ospf database network 1.2.3.4 adv-router 2.3.4.5

Output The following shows typical output.

Example output from the show ip ospf database network command

```
      OSPF Router process 200 with ID (192.30.30.2)
        Net Link States (Area 0.0.0.0)
LS age: 1387
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.10.10.9 (address of Designated Router)
Advertising Router: 192.30.30.3
LS Seq Number: 80000001
Checksum: 0xe1b0
Length: 32
Network Mask: /24
    Attached Router: 192.20.20.1
    Attached Router: 192.30.30.3
      OSPF Router process 200 with ID (192.30.30.2)
        Net Link States (Area 0.0.0.0)
...
```

show ip ospf database nssa-external

Overview Use this command to display information about the NSSA external LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip ospf database nssa-external [*<ip-address>*] [self-originate|adv-router *<adv-router-id>*]

Parameter	Description
<i><ip-address></i>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <i><adv-router-id></i>	Displays all the LSAs of the specified router. The Advertising Router ID <i><adv-router-id></i> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database nssa-external
awplus# show ip ospf database nssa-external self-originate
awplus# show ip ospf database nssa-external adv-router

Output The following shows typical output.

**Example output from the show ip ospf database nssa-external
adv-router command**

```
      OSPF Router process 100 with ID (10.10.11.50)
        NSSA-external Link States (Area 0.0.0.0)
        NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 78
Options: 0x0 (*|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 0.0.0.0 (External Network Number For NSSA)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xc9b6
Length: 36
Network Mask: /0
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 1
    NSSA: Forward Address: 0.0.0.0

      OSPF Router process 100 with ID (10.10.11.50)
        NSSA-external Link States (Area 0.0.0.0)
        NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 78
Options: 0x0 (*|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 0.0.0.0 (External Network Number For NSSA)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xc9b6
Length: 36
Network Mask: /0
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 1
    NSSA: Forward Address: 0.0.0.0
    External Route Tag: 0
        NSSA-external Link States (Area 0.0.0.1 [NSSA])
```

show ip ospf database opaque-area

Overview Use this command to display information about the area-local (link state type 10) scope LSAs. Type-10 Opaque LSAs are not flooded beyond the borders of their associated area.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ip ospf database opaque-area [<ip-address>] [self-originate|adv-router <adv-router-id>]`

Parameter	Description
<ip-address>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <adv-router-id>	Displays all the LSAs of the specified router. The Advertising Router ID <adv-router-id> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples

```
awplus# show ip ospf database opaque-area
awplus# show ip ospf database opaque-area self-originate
awplus# show ip ospf database opaque-area 1.2.3.4 adv-router
2.3.4.5
```

Output The following shows typical output.

Example output from the show ip ospf database opaque-area command

```
OSPF Router process 100 with ID (10.10.11.50)
Area-Local Opaque-LSA (Area 0.0.0.0)
LS age: 262
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: Area-Local Opaque-LSA
Link State ID: 10.0.25.176 (Area-Local Opaque-Type/ID)
Opaque Type: 10
Opaque ID: 6576
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xb413
Length: 26
```

show ip ospf database opaque-as

Overview Use this command to display information about the link-state type 11 LSAs. This type of link-state denotes that the LSA is flooded throughout the Autonomous System (AS).

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ip ospf database opaque-as [<ip-address>] [self-originate] adv-router <adv-router-id>]`

Parameter	Description
<ip-address>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <adv-router-id>	Displays all the LSAs of the specified router. The Advertising Router ID <adv-router-id> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples `awplus# show ip ospf database opaque-as`
`awplus# show ip ospf database opaque-as self-originate`
`awplus# show ip ospf database opaque-as 1.2.3.4 adv-router 2.3.4.5`

Output The following shows typical output.

Example output from the show ip ospf database opaque-as command

```
OSPF Router process 100 with ID (10.10.11.50)
      AS-Global Opaque-LSA
LS age: 325
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external Opaque-LSA
Link State ID: 11.10.9.23 (AS-external Opaque-Type/ID)
Opaque Type: 11
Opaque ID: 657687
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xb018
Length: 25
```

show ip ospf database opaque-link

Overview Use this command to display information about the link-state type 9 LSAs. This type denotes a link-local scope. The LSAs are not flooded beyond the local network.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf database opaque-link [<ip-address>] [self-originate|adv-router <adv-router-id>]

Parameter	Description
<ip-address>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <adv-router-id>	Displays all the LSAs of the specified router. The Advertising Router ID <adv-router-id> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database opaque-link
awplus# show ip ospf database opaque-link self-originate
awplus# show ip ospf database opaque-link 1.2.3.4 adv-router 2.3.4.5

Output The following shows typical output.

Example output from the show ip ospf database opaque-link command

```
OSPF Router process 100 with ID (10.10.11.50)
Link-Local Opaque-LSA (Link hme0:10.10.10.50)
LS age: 276
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: Link-Local Opaque-LSA
Link State ID: 10.0.220.247 (Link-Local Opaque-Type/ID)
Opaque Type: 10
Opaque ID: 56567
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x744e
Length: 26
Link-Local Opaque-LSA (Link hme1:10.10.11.50)
```


show ip ospf database router

Overview Use this command to display information only about the router LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip ospf database router [*<ip-address>*] [self-originate|adv-router *<adv-router-id>*]

Parameter	Description
<i><ip-address></i>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <i><adv-router-id></i>	Displays all the LSAs of the specified router. The Advertising Router ID <i><adv-router-id></i> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database router
awplus# show ip ospf database router self-originate
awplus# show ip ospf database router 1.2.3.4 adv-router 2.3.4.5

Output The following shows typical output.

Example output from the show ip ospf database router command

```
      OSPF Router process 100 with ID (10.10.11.50)
      Router Link States (Area 0.0.0.0)
LS age: 878
Options: 0x2 (*|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 10.10.11.50
Advertising Router: 10.10.11.50
LS Seq Number: 80000004
Checksum: 0xe39e
Length: 36
  Number of Links: 1
    Link connected to: Stub Network
      (Link ID) Network/subnet number: 10.10.10.0
      (Link Data) Network Mask: 255.255.255.0
      Number of TOS metrics: 0
      TOS 0 Metric: 10

      Router Link States (Area 0.0.0.1)
LS age: 877
Options: 0x2 (*|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 10.10.11.50
Advertising Router: 10.10.11.50
LS Seq Number: 80000003
Checksum: 0xee93
Length: 36
  Number of Links: 1
    Link connected to: Stub Network
      (Link ID) Network/subnet number: 10.10.11.0
      (Link Data) Network Mask: 255.255.255.0
      Number of TOS metrics: 0
      TOS 0 Metric: 10
```

show ip ospf database summary

Overview Use this command to display information about the summary LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip ospf database summary [*<ip-address>*] [self-originate|adv-router *<adv-router-id>*]

Parameter	Description
<i><ip-address></i>	A link state ID, as an IP address.
self-originate	Displays self-originated link states.
adv-router <i><adv-router-id></i>	Displays all the LSAs of the specified router. The Advertising Router ID <i><adv-router-id></i> is usually entered in IPv4 address format A.B.C.D. Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf database summary
awplus# show ip ospf database summary self-originate
awplus# show ip ospf database summary adv-router 2.3.4.5

Output The following shows typical output.

Example output from the show ip ospf database summary command

```
OSPF Router process 100 with ID (10.10.11.50)
  Summary Link States (Area 0.0.0.0)
  Summary Link States (Area 0.0.0.1)
LS age: 1124
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.10.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x41a2
Length: 28
Network Mask: /24
  TOS: 0  Metric: 10
```

Example output from the show ip ospf database summary self-originate command

```
OSPF Router process 100 with ID (10.10.11.50)
  Summary Link States (Area 0.0.0.0)
LS age: 1061
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
  TOS: 0  Metric: 10
  Summary Link States (Area 0.0.0.1)
LS age: 1061
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
  TOS: 0  Metric: 10
  Summary Link States (Area 0.0.0.1)
LS age: 1061
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.10.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x41a2
Length: 28
Network Mask: /24
  TOS: 0  Metric: 10
```

Example output from the show ip ospf database summary adv-router <ip-address> command

```
OSPF Router process 100 with ID (10.10.11.50)
  Summary Link States (Area 0.0.0.0)
LS age: 989
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
```

```
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0   Metric: 10
    Summary Link States (Area 0.0.0.1)
LS age: 989
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0   Metric: 10
```

show ip ospf interface

Overview Use this command to display interface information for OSPF.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip ospf interface [<interface-list>]

Parameter	Description
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • the loopback interface (lo) • a continuous range of interfaces separated by a hyphen (e.g. vlan10-20) • a comma-separated list (e.g. vlan1,vlan10-20). Do not mix interface types in a list.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf interface vlan2

Output The following shows typical output.

Example output from the show ip ospf interface command

```
awplus#show ip ospf interface
vlan2 is up, line protocol is up
Internet Address 1.1.1.1/24, Area 0.0.0.0, MTU 1500
Process ID 0, Router ID 33.33.33.33, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State Waiting, Priority 1, TE Metric 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:02
Neighbor Count is 0, Adjacent neighbor count is 0
Crypt Sequence Number is 1106347721
Hello received 0 sent 1, DD received 0 sent 0
LS-Req received 0 sent 0, LS-Upd received 0 sent 0
LS-Ack received 0 sent 0, Discarded 0
```

show ip ospf neighbor

Overview Use this command to display information on OSPF neighbors. Include the **ospf-id** parameter with this command to display information about specified instances.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf [*<ospf-id>*] neighbor *<neighbor-ip-addr>* [detail]
show ip ospf [*<ospf-id>*] neighbor detail [all]
show ip ospf [*<ospf-id>*] neighbor [all]
show ip ospf [*<ospf-id>*] neighbor interface *<ip-addr>*

Parameter	Description
<i><ospf-id></i>	<0-65535> The ID of the router process for which information will be displayed. If this parameter is included, only the information for this specified routing process is displayed.
<i><neighbor-ip-addr></i>	The Neighbor ID, entered as an IP address.
all	Include downstatus neighbor.
detail	Detail of all neighbors.
<i><ip-addr></i>	IP address of the interface.

Mode User Exec and Privileged Exec

Examples awplus# show ip ospf neighbor
awplus# show ip ospf 100 neighbor
awplus# show ip ospf neighbor detail

Output Note that before a device enters OSPF Graceful Restart it first informs its OSPF neighbors. In the **show** output, an * symbol beside the **Dead Time** parameter indicates that the device has been notified of a neighbor entering the graceful restart state.

Example output from the show ip ospf neighbor command

```
awplus#show ip ospf neighbor

OSPF process 1:
Neighbor ID    Pri   State           Dead Time   Address      Interface
10.10.10.50    1     Full/DR         00:00:38    10.10.10.50  vlan1
OSPF process 100:
Neighbor ID    Pri   State           Dead Time   Address      Interface
10.10.11.50    1     Full/Backup     00:00:31    10.10.11.50  vlan2
awplus#show ip ospf 1 neighbor
OSPF process 1:
Neighbor ID    Pri   State           Dead Time   Address      Interface
10.10.10.50    1     Full/DR         00:00:38*   10.10.10.50  vlan1
```

Example output from the show ip ospf <ospf-id> neighbor command

```
awplus#show ip ospf 100 neighbor

OSPF process 100:
Neighbor ID    Pri   State           Dead Time   Address      Interface
192.168.0.3    50    2-Way/DROther   00:01:59*   192.168.200.3  vlan200
```

Example output from the show ip ospf neighbor detail command

```
awplus#show ip ospf neighbor detail
Neighbor 10.10.10.50, interface address 10.10.10.50
  In the area 0.0.0.0 via interface vlan5
  Neighbor priority is 1, State is Full, 5 state changes
  DR is 10.10.10.50, BDR is 10.10.10.10
  Options is 0x42 (*|0|-|-|-|E|-)
  Dead timer due in 00:00:38
  Neighbor is up for 00:53:07
  Database Summary List 0
  Link State Request List 0
  Link State Retransmission List 0
  Crypt Sequence Number is 0
  Thread Inactivity Timer on
  Thread Database Description Retransmission off
  Thread Link State Request Retransmission off
  Thread Link State Update Retransmission on
Neighbor 10.10.11.50, interface address 10.10.11.50
  In the area 0.0.0.0 via interface vlan2
  Neighbor priority is 1, State is Full, 5 state changes
  DR is 10.10.11.10, BDR is 10.10.11.50
  Options is 0x42 (*|0|-|-|-|E|-)
  Dead timer due in 00:00:31
  Neighbor is up for 00:26:50
  Database Summary List 0
  Link State Request List 0
  Link State Retransmission List 0
  Crypt Sequence Number is 0
  Thread Inactivity Timer on
  Thread Database Description Retransmission off
  Thread Link State Request Retransmission off
  Thread Link State Update Retransmission on
```


show ip ospf route

Overview Use this command to display the OSPF routing table. Include the **ospf-id** parameter with this command to display the OSPF routing table for specified instances.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf [*<ospf-id>*] route

Parameter	Description
<i><ospf-id></i>	<i><0-65535></i> The ID of the router process for which information will be displayed. If this parameter is included, only the information for this specified routing process is displayed.

Mode User Exec and Privileged Exec

Examples To display the OSPF routing table, use the command:

```
awplus# show ip ospf route
```

Output The following shows typical output.

Example output from the show ip ospf route command for a specific process

```
awplus#show ip ospf route

OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2

O  10.10.0.0/24 [10] is directly connected, vlan1, Area 0.0.0.0
O  10.10.11.0/24 [10] is directly connected, vlan2, Area 0.0.0.0
O  10.10.11.100/32 [10] is directly connected, lo, Area 0.0.0.0
E2 10.15.0.0/24 [10/50] via 10.10.0.1, vlan1
IA 172.16.10.0/24 [30] via 10.10.11.50, vlan2, Area 0.0.0.0
E2 192.168.0.0/16 [10/20] via 10.10.11.50, vlan2
```

show ip ospf virtual-links

Overview Use this command to display virtual link information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip ospf virtual-links

Mode User Exec and Privileged Exec

Examples To display virtual link information, use the command:

```
awplus# show ip ospf virtual-links
```

Output The following shows typical output.

Example output from the show ip ospf virtual-links command

```
awplus#show ip ospf virtual-links
Virtual Link VLINK0 to router 10.10.0.9 is up
  Transit area 0.0.0.1 via interface vlan5
  Transmit Delay is 1 sec, State Point-To-Point,
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
  Retransmit 5
    Hello due in 00:00:02
    Adjacency state Full
Virtual Link VLINK1 to router 10.10.0.123 is down
  Transit area 0.0.0.1 via interface *
  Transmit Delay is 1 sec, State Down,
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
  Retransmit 5
    Hello due in inactive
    Adjacency state Down
```

show ip protocols ospf

Overview Use this command to display OSPF process parameters and statistics.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip protocols ospf

Mode User Exec and Privileged Exec

Examples To display OSPF process parameters and statistics, use the command:
awplus# show ip protocols ospf

Output The following shows typical output.

Example output from the show ip protocols ospf command

```
Routing Protocol is "ospf 200"
  Invalid after 0 seconds, hold down 0, flushed after 0
  Outgoing update filter list for all interfaces is
    Redistributed kernel filtered by filter1
  Incoming update filter list for all interfaces is
  Redistributing: kernel
  Routing for Networks:
    192.30.30.0/24
    192.40.40.0/24
  Routing Information Sources:
    Gateway          Distance          Last Update
  Distance: (default is 110)
    Address          Mask              Distance List
```

summary-address

Overview Use this command to summarize, or possibly suppress, external routes that have the specified address range.

Use the **no** variant of this command to stop summarizing, or suppressing, external routes that have the specified address range.

Syntax `summary-address <ip-addr/prefix-length> [not-advertise] [tag <0-4294967295>]`
`no summary-address <ip-addr/prefix-length> [not-advertise] [tag <0-4294967295>]`

Parameter	Description
<code><ip-addr/prefix-length></code>	Specifies the base IP address of the summary address. The range of addresses given as IPv4 starting address and a prefix length.
<code>not-advertise</code>	Set the not-advertise option if you do not want OSPF to advertise either the summary address or the individual networks within the range of the summary address.
<code>tag <0-4294967295></code>	The tag parameter specifies the tag value that OSPF places in the AS external LSAs created as a result of redistributing the summary route. The tag overrides tags set by the original route.

Default The default tag value for a summary address is 0.

Mode Router Configuration

Usage notes An address range is a pairing of an address and a mask that is almost the same as IP network number. For example, if the specified address range is 192.168.0.0/255.255.240.0, it matches: 192.168.1.0/24, 192.168.4.0/22, 192.168.8.128/25 and so on.

Redistributing routes from other protocols into OSPF requires the router to advertise each route individually in an external LSA. Use the **summary address** command to advertise one summary route for all redistributed routes covered by a specified network address and mask. This helps decrease the size of the OSPF link state database.

Ensure OSPF routes exist in the summary address range for advertisement before using this command.

Example The following example uses the **summary-address** command to aggregate external LSAs that match the network 172.16.0.0/16 and assign a Tag value of 3.

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# summary-address 172.16.0.0/16 tag 3
```

timers spf exp

Overview Use this command to adjust route calculation timers using exponential back-off delays.

Use **no** form of this command to return to the default exponential back-off timer values.

Syntax `timers spf exp <min-holdtime> <max-holdtime>`
`no timers spf exp`

Parameter	Description
<code><min-holdtime></code>	<code><0-2147483647></code> Specifies the minimum delay between receiving a change to the SPF calculation in milliseconds. The default SPF min-holdtime value is 50 milliseconds.
<code><max-holdtime></code>	<code><0-2147483647></code> Specifies the maximum delay between receiving a change to the SPF calculation in milliseconds. The default SPF max-holdtime value is 50 seconds.

Mode Router Configuration

Default The default SPF min-holdtime is 50 milliseconds. The default SPF max-holdtime is 40 seconds.

Usage This command configures the minimum and maximum delay time between the receipt of a topology change and the calculation of the Shortest Path First (SPF).

Examples To set the minimum delay time to 5 milliseconds and maximum delay time to 10 milliseconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# timers spf exp 5 10
```

To reset the minimum and maximum delay times to the default values, use the commands:

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# no timers spf exp
```

Related commands [timers spf exp](#)

undebbug ospf events

Overview This command applies the functionality of the no **debug ospf events**.

undebbug ospf ifsm

Overview This command applies the functionality of the no **debug ospf ifsm**.

undebbug ospf lsa

Overview This command applies the functionality of the no **debug ospf lsa**.

undebbug ospf nfsm

Overview This command applies the functionality of the no **debug ospf nfsm**.

undebbug ospf nsm

Overview This command applies the functionality of the no **debug ospf nsm**.

undebbug ospf packet

Overview This command applies the functionality of the no **debug ospf packet**.

undebbug ospf route

Overview This command applies the functionality of the no **debug ospf route**.

27

OSPFv3 for IPv6 Commands

- Contents**
- **Introduction** on page 1284
 - **abr-type** on page 1285
 - **area authentication ipsec spi** on page 1286
 - **area default-cost (IPv6 OSPF)** on page 1289
 - **area encryption ipsec spi esp** on page 1290
 - **area range (IPv6 OSPF)** on page 1293
 - **area stub (IPv6 OSPF)** on page 1294
 - **area virtual-link (IPv6 OSPF)** on page 1295
 - **area virtual-link authentication ipsec spi** on page 1298
 - **area virtual-link encryption ipsec spi** on page 1300
 - **auto-cost reference bandwidth (IPv6 OSPF)** on page 1304
 - **bandwidth** on page 1307
 - **clear ipv6 ospf process** on page 1308
 - **debug ipv6 ospf events** on page 1309
 - **debug ipv6 ospf ifsm** on page 1310
 - **debug ipv6 ospf lsa** on page 1311
 - **debug ipv6 ospf nlsn** on page 1312
 - **debug ipv6 ospf packet** on page 1313
 - **debug ipv6 ospf route** on page 1314
 - **default-information originate** on page 1315
 - **default-metric (IPv6 OSPF)** on page 1317
 - **distance (IPv6 OSPF)** on page 1318
 - **distribute-list (IPv6 OSPF)** on page 1320
 - **ipv6 ospf authentication spi** on page 1323
 - **ipv6 ospf cost** on page 1326
 - **ipv6 ospf dead-interval** on page 1328
 - **ipv6 ospf display route single-line** on page 1329
 - **ipv6 ospf encryption spi esp** on page 1330
 - **ipv6 ospf hello-interval** on page 1333
 - **ipv6 ospf neighbor** on page 1334
 - **ipv6 ospf network** on page 1336
 - **ipv6 ospf priority** on page 1337
 - **ipv6 ospf retransmit-interval** on page 1338
 - **ipv6 ospf transmit-delay** on page 1339
 - **ipv6 router ospf area** on page 1340
 - **max-concurrent-dd (IPv6 OSPF)** on page 1342
 - **passive-interface (IPv6 OSPF)** on page 1343

- **redistribute (IPv6 OSPF)** on page 1344
- **restart ipv6 ospf graceful** on page 1346
- **router ipv6 ospf** on page 1347
- **router-id (IPv6 OSPF)** on page 1349
- **service ospf6** on page 1350
- **show debugging ipv6 ospf** on page 1351
- **show ipv6 ospf** on page 1352
- **show ipv6 ospf database** on page 1354
- **show ipv6 ospf database external** on page 1356
- **show ipv6 ospf database grace** on page 1357
- **show ipv6 ospf database inter-prefix** on page 1358
- **show ipv6 ospf database inter-router** on page 1359
- **show ipv6 ospf database intra-prefix** on page 1360
- **show ipv6 ospf database link** on page 1361
- **show ipv6 ospf database network** on page 1362
- **show ipv6 ospf database router** on page 1364
- **show ipv6 ospf interface** on page 1368
- **show ipv6 ospf neighbor** on page 1370
- **show ipv6 ospf route** on page 1372
- **show ipv6 ospf virtual-links** on page 1373
- **summary-address (IPv6 OSPF)** on page 1374
- **timers spf exp (IPv6 OSPF)** on page 1376
- **undebg ipv6 ospf events** on page 1377
- **undebg ipv6 ospf ifsm** on page 1378
- **undebg ipv6 ospf lsa** on page 1379
- **undebg ipv6 ospf nfsm** on page 1380
- **undebg ipv6 ospf packet** on page 1381
- **undebg ipv6 ospf route** on page 1382

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure OSPFv3 for IPv6. See the **OSPFv3 Feature Overview and Configuration Guide** for more information and examples.

abr-type

Overview Use this command to set an OSPF Area Border Router (ABR) type.

Use the **no** variant of this command to revert the ABR type to the default setting (cisco).

Syntax `abr-type {cisco|ibm|standard}`
`no abr-type [cisco|ibm|standard]`

Parameter	Description
cisco	Specifies an alternative ABR using Cisco implementation (RFC 3509). This is the default ABR type.
ibm	Specifies an alternative ABR using IBM implementation (RFC 3509).
standard	Specifies a standard behavior ABR (RFC 2328).

Default ABR type cisco

Mode Router Configuration

Usage notes Specifying the ABR type allows better interoperability between different implementations. This command is specially useful in a multi-vendor environment. The different ABR types are:

- Cisco ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and one of them is the backbone area.
- IBM ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and the backbone area is configured. In this case the configured backbone need not be actively connected.
- Standard ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached to it.

Example To set the ABR type to **ibm** use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf 100
awplus(config-router)# abr-type ibm
```

area authentication ipsec spi

Overview Use this command in Router Configuration mode to enable either MD5 (Message-Digest 5) or SHA1 (Secure Hash Algorithm 1) authentication for a specified OSPF area.

Use the **no** variant of this command in Router Configuration mode to disable the authentication configured for a specified OSPF area.

Syntax `area <area-id> authentication ipsec spi <256-4294967295> {md5 <MD5-key>|sha1 <SHA1-key>}`
`no area <area-id> authentication ipsec spi <256-4294967295>`

Parameter	Other parameter descriptions
<256-4294967295>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
md5	Specify the MD5 (Message-Digest 5) hashing algorithm.
<MD5-key>	Enter an MD5 key containing up to 32 hexadecimal characters.
sha1	Specify the SHA-1 (Secure Hash Algorithm 1) hashing algorithm.
<SHA1-key>	Enter an SHA-1 key containing up to 40 hexadecimal characters.

Mode Router Configuration

Usage notes Use this command on an OSPFv3 area; use the [area virtual-link authentication ipsec spi](#) command on an OSPFv3 area virtual link. Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

See the [OSPFv3 Feature Overview and Configuration Guide](#) for more information and examples.

NOTE: *You can configure an authentication security policy (SPI) on an OSPFv3 area with this command, or on an interface with the command.*

When you configure authentication for an area, the security policy is applied to all interfaces in the area. However, we recommend a different authentication security policy is applied to each interface for higher security.

*If you apply the **ipv6 ospf authentication null** command, this affects authentication configured on both the interface and the OSPFv3 area.*

This is due to OSPFv3 hello messages ingressing interfaces, which are part of area authentication, not being authenticated. So neighbors time out.

Example To enable MD5 authentication with a 32 hexadecimal character key for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 authentication ipsec spi 1000 md5
1234567890ABCDEF1234567890ABCDEF
```

To enable SHA-1 authentication with a 40 hexadecimal character key for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 authentication ipsec spi 1000 sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To disable authentication for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no area 1 authentication ipsec spi 1000
```

Related commands

- area encryption ipsec spi esp**
- area virtual-link authentication ipsec spi**
- area virtual-link encryption ipsec spi**
- ipv6 ospf authentication spi**
- ipv6 ospf encryption spi esp**
- show ipv6 ospf**

area default-cost (IPv6 OSPF)

Overview This command specifies a cost for the default summary route sent into a stub area.

The **no** variant of this command removes the assigned default-route cost.

Syntax `area <area-id> default-cost <0-16777215>`
`no area <area-id> default-cost`

Parameter	Other parameter descriptions
default-cost	Indicates the cost for the default summary route used for a stub area. Default: 1

Mode Router Configuration

Usage The default-cost option provides the metric for the summary default route, generated by the area border router, into the stub area. Use this option only on an area border router that is attached to the stub area.

Example To set the default cost to 10 in area 1 for the OSPF process P2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf P2
awplus(config-router)# area 1 default-cost 10
```

Related commands [area stub \(IPv6 OSPF\)](#)

area encryption ipsec spi esp

Overview Use this command in Router Configuration mode to enable either AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) or 3DES (Triple Data Encryption Standard) ESP (Encapsulating Security Payload) encryption for a specified OSPF area.

Use the **no** variant of this command in Router Configuration mode to disable the encryption configured for a specified OSPF area.

Syntax `area <area-id> encryption ipsec spi <256-4294967295> esp {aes-cbc <AES-CBC-key>|3des <3DES-key>|null}{md5 <MD5-key>|sha1 <SHA1-key>}`
`no area <area-id> encryption ipsec spi <256-4294967295>`

Parameter	Other parameter descriptions
<256-4294967295>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
esp	Specify the esp keyword (Encapsulating Security Payload) to then apply either AES-CBC or 3DES encryption.
aes-cbc	Specify this keyword to enable AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) encryption.
<AES-CBC-key>	Enter an AES-CBC key containing either 32, 48, or 64 hexadecimal characters.
3des	Specify 3DES (Triple Data Encryption Standard) encryption.
<3DES-key>	Enter a 3DES key containing 48 hexadecimal characters.
null	Specify ESP without AES-CBC or 3DES encryption applied.
md5	Specify the MD5 (Message-Digest 5) encryption algorithm.
<MD5-key>	Enter an MD5 key containing 32 hexadecimal characters.
sha1	Specify the SHA-1 (Secure Hash Algorithm 1) encryption algorithm.
<SHA1-key>	Enter an SHA-1 key containing 40 hexadecimal characters.

Mode Router Configuration

Usage notes When you issue this command, authentication and encryption are both enabled.

Use this command on an OSPFv3 area, use the **area virtual-link encryption ipsec spi** command on an OSPFv3 area virtual link. Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

Security is achieved using the IPv6 ESP extension header. The IPv6 ESP extension header is used to provide confidentiality, integrity, authentication, and confidentiality. Authentication fields are removed from OSPF for IPv6 packet headers, so applying IPv6 ESP extension headers are required for integrity, authentication, and confidentiality.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

See the **OSPFv3 Feature Overview and Configuration Guide** for more information and examples.

NOTE: You can configure an encryption security policy (SPI) on an OSPFv3 area with this command, or on an interface with the command.

When you configure encryption for an area, the security policy is applied to all interfaces in the area. However, we recommend a different encryption security policy is applied to each interface for higher security.

*If you apply the **ipv6 ospf encryption null** command, this affects encryption configured on both the interface and the OSPFv3 area.*

This is due to OSPFv3 hello messages ingressing interfaces, which are part of area encryption, not being encrypted. So neighbors time out.

Example To enable ESP encryption, but not apply an AES-CBC key or a 3DES key, and MD5 authentication with a 32 hexadecimal character key for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 encryption ipsec spi 1000 esp null
md5 1234567890ABCDEF1234567890ABCDEF
```

To enable ESP encryption, but not apply an AES-CBC key or a 3DES key, and SHA-1 authentication with a 40 hexadecimal character key for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 encryption ipsec spi 1000 esp null
sha1 1234567890ABCDEF1234567890ABCDEF12345678
```

To enable ESP encryption with a 48 hexadecimal character 3DES key and a 32 hexadecimal character MD5 authentication for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 encryption ipsec spi 1000 esp
3des 1234567890ABCDEF1234567890ABCDEF1234567890ABCDEF md5
1234567890ABCDEF1234567890ABCDEF
```

To enable ESP encryption with a 32 hexadecimal character AES-CBC key, and a 40 hexadecimal character SHA-1 authentication key for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 encryption ipsec spi
1000 esp aes-cbc 1234567890ABCDEF1234567890ABCDEF sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To disable ESP encryption for OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no area 1 encryption ipsec spi 1000
```

Related commands

- [area authentication ipsec spi](#)
- [area virtual-link authentication ipsec spi](#)
- [area virtual-link encryption ipsec spi](#)
- [ipv6 ospf authentication spi](#)
- [ipv6 ospf encryption spi esp](#)
- [show ipv6 ospf](#)

area range (IPv6 OSPF)

Overview Use this command to summarize OSPFv3 routes at an area boundary, configuring an IPv6 address range which consolidates OSPFv3 routes. By default, this feature is not enabled.

A summary route created by this command is then advertised to other areas by the Area Border Routers (ABRs). In this way, routing information is condensed at area boundaries and outside the area so that routes are exchanged between areas in an efficient manner.

If the network numbers in an area are arranged into sets of contiguous routes, the ABRs can be configured to advertise a summary route that covers all the individual networks within the area that fall into the specified range.

The **no** variant of this command disables this function and restores default behavior.

Syntax `area <area-id> range <ipv6address/prefix-length> [advertise|not-advertise]`
`no area <area-id> range <ipv6address/prefix-length>`

Parameter	Other parameter descriptions
<code><ip-addr/prefix-length></code>	The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<code>advertise</code>	Advertise this range as a summary route into other areas.
<code>not-advertise</code>	Do not advertise this range.

Default The area range is not configured by default. The area range is advertised if it is configured.

Mode Router Configuration

Usage notes You can configure multiple ranges on a single area with multiple instances of this command, so OSPFv3 summarizes addresses for different sets of IPv6 address ranges.

Ensure OSPFv3 IPv6 routes exist in the area range for advertisement before using this command.

Example

```
awplus# configure terminal
awplus(config)# router ipv6 ospf P2
awplus(config-router)# area 1 range 2000::/3
```

area stub (IPv6 OSPF)

Overview This command defines an OSPF area as a stub area. By default, no stub area is defined.

Use this command when routers in the area do not require learning about external LSAs. You can define the area as a totally stubby area by configuring the Area Border Router of that area using the **area stub no-summary** command.

The **no** variant of this command removes this definition.

Syntax `area <area-id> stub [no-summary]`
`no area <area-id> stub [no-summary]`

Parameter	Other parameter descriptions
no-summary	Stops an ABR from sending summary link advertisements into the stub area.

Mode Router Configuration

Usage There are two stub area router configuration commands: the **area stub** and **area default-cost** commands. In all routers attached to the stub area, configure the area by using the **area stub** command. For an area border router (ABR) attached to the stub area, also use the **area default-cost** command.

Example `awplus# configure terminal`
`awplus(config)# router ipv6 ospf 100`
`awplus(config-router)# area 100 stub`

Related commands [area default-cost \(IPv6 OSPF\)](#)

area virtual-link (IPv6 OSPF)

Overview This command configures a link between a non-backbone area and the backbone, through other non-backbone areas.

In OSPF, all non-backbone areas must be connected to a backbone area. If the connection to the backbone is lost, the virtual link repairs the connection.

The **no** variant of this command removes the virtual link.

Syntax area <area-id> virtual-link <router-id>
no area <area-id> virtual-link <router-id>
area <area-id> virtual-link <router-id>
no area <area-id> virtual-link <router-id>
area <area-id> virtual-link <router-id> [hello-
interval <1-65535>] [retransmit-interval <1-65535>] [transmit-
delay <1-65535>]
no area <area-id> virtual-link <router-id> [hello-interval]
[retransmit-interval] [transmit-delay]

Parameter	Other parameter descriptions
<router-id>	The OSPF router ID of the virtual link neighbor.
dead-interval	If no packets are received from a particular neighbor for dead-interval seconds, the router considers the neighbor router to be off-line. Default: 40 seconds <1-65535> The number of seconds in the interval.
hello-interval	The interval the router waits before it sends a hello packet. Default: 10 seconds <1-65535> The number of seconds in the interval.
retransmit-interval	The interval the router waits before it retransmits a packet. Default: 5 seconds <1-65535> The number of seconds in the interval.
transmit-delay	The interval the router waits before it transmits a packet. Default: 1 seconds <1-65535> The number of seconds in the interval.

Mode Router Configuration

Usage You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers, joined by a virtual link, as if they were connected by an unnumbered point-to-point network. To configure a virtual link, you require:

- The transit area-ID, i.e. the area-ID of the non-backbone area that the two backbone routers are both connected to.
- The corresponding virtual link neighbor's router ID. To see the router ID use the **show ipv6 ospf** command.

Configure the **hello-interval** to be the same for all routers attached to a common network. A short **hello-interval** results in the router detecting topological changes faster but also an increase in the routing traffic.

The **retransmit-interval** is the expected round-trip delay between any two routers in a network. Set the value to be greater than the expected round-trip delay to avoid needless retransmissions.

The **transmit-delay** is the time taken to transmit a link state update packet on the interface. Before transmission, the link state advertisements in the update packet, are incremented by this amount. Set the **transmit-delay** to be greater than zero. Also, take into account the transmission and propagation delays for the interface.

Example To configure a virtual link through area 1 to the router with router-ID 10.10.11.50, use the following commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf 100
awplus(config-router)# area 1 virtual-link 10.10.11.50 hello 5
dead 10
```

Related commands **show ipv6 ospf**

area virtual-link authentication ipsec spi

Overview Use this command in Router Configuration mode to enable authentication for virtual links in a specified OSPF area.

Use the **no** variant of this command in Router Configuration mode to disable authentication for virtual links in a specified OSPF area.

Syntax `area <area-id> virtual-link <router-ID> authentication ipsec spi <256-4294967295> {md5 <MD5-key>|sha1 <SHA1-key>}`
`no area <area-id> virtual-link <router-ID> authentication ipsec spi <256-4294967295>`

Parameter	Other parameter descriptions
virtual-link	Specify a virtual link and its parameters.
<router-ID>	Enter a router ID associated with a virtual link neighbor in IPv4 address format A.B.C.D.
authentication	Specify this keyword to enable authentication.
ipsec	Specify this keyword to use IPsec authentication.
spi	Specify this keyword to set the SPI (Security Parameters Index).
<256-4294967295>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
md5	Specify the MD5 (Message-Digest 5) encryption algorithm.
<MD5-key>	Enter an MD5 key containing 32 hexadecimal characters.
sha1	Specify the SHA-1 (Secure Hash Algorithm 1) encryption algorithm.
<SHA1-key>	Enter an SHA-1 key containing 40 hexadecimal characters.

Mode Router Configuration

Usage notes Use this command on an OSPFv3 area virtual link, use the **area authentication ipsec spi** command on an OSPFv3 area. Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

OSPFv3 areas are connected to a backbone area. Virtual links can be configured to repair lost connections to a backbone area for OSPFv3 areas. To configure an OSPFv3 virtual link, use a router ID instead of the IPv6 prefix of the router.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

See the **OSPFv3 Feature Overview and Configuration Guide** for more information and examples.

Example To enable MD5 authentication with a 32 hexadecimal character key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link
10.0.0.1 authentication ipsec spi 1000 md5
1234567890ABCDEF1234567890ABCDEF
```

To enable SHA-1 authentication with a 40 hexadecimal character key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link
10.0.0.1 authentication ipsec spi 1000 sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To disable authentication for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no area 1 virtual-link ipsec spi 1000
```

Related commands **area authentication ipsec spi**
area encryption ipsec spi esp
area virtual-link encryption ipsec spi
show ipv6 ospf virtual-links

area virtual-link encryption ipsec spi

Overview Use this command in Router Configuration mode to enable either AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) or 3DES (Triple Data Encryption Standard) ESP (Encapsulating Security Payload) encryption for virtual links in a specified OSPF area.

Use the **no** variant of this command in Router Configuration mode to disable encryption configured for virtual links in a specified OSPF area.

Syntax area <area-id> virtual-link <router-ID> encryption ipsec spi
<256-4294967295> esp {aes-cbc <AES-CBC-key>|3des <3DES-key>|
null}{md5 <MD5-key>|sha1 <SHA1-key>}
no area <area-id> encryption ipsec spi <256-4294967295>

Parameter	Other parameter descriptions
virtual-link	Specify a virtual link and its parameters.
<router-ID>	Enter a router ID associated with a virtual link neighbor in IPv4 address format A.B.C.D.
encryption	Specify this keyword to enable encryption.
ipsec	Specify this keyword to use IPsec authentication.
spi	Specify this keyword to set the SPI (Security Parameters Index).
<256-4294967295>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
esp	Specify the esp keyword (Encapsulating Security Payload) to then apply either AES-CBC or 3DES encryption.
aes-cbc	Specify this keyword to enable AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) encryption.
<AES-CBC-key>	Enter an AES-CBC key containing either 32, 48, or 64 hexadecimal characters.
3des	Specify 3DES (Triple Data Encryption Standard) encryption.
<3DES-key>	Enter a 3DES key containing 48 hexadecimal characters.
null	Specify ESP without AES-CBC or 3DES encryption applied.
md5	Specify the MD5 (Message-Digest 5) encryption algorithm.
<MD5-key>	Enter an MD5 key containing 32 hexadecimal characters.
sha1	Specify the SHA-1 (Secure Hash Algorithm 1) encryption algorithm.
<SHA1-key>	Enter an SHA-1 key containing 40 hexadecimal characters.

Mode Router Configuration

Usage notes When you issue this command, authentication and encryption are both enabled.

Use this command on an OSPFv3 area virtual link, use the **area encryption ipsec spi esp** command on an OSPFv3 area. Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

Security is achieved using the IPv6 ESP extension header. ESP is used to provide confidentiality, integrity, authentication, and confidentiality. Authentication fields are removed from OSPF for IPv6 packet headers. The IPv6 ESP extension header is required for integrity, authentication, and confidentiality.

Note that interface configuration takes priority over area configuration. If an interface configuration is removed then an area configuration is applied to an interface instead.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

See the **OSPFv3 Feature Overview and Configuration Guide** for more information and examples.

Example To enable ESP encryption, but not apply an AES-CBC key or a 3DES key, and MD5 authentication with a 32 hexadecimal character key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link 10.0.0.1 encryption
ipsec spi 1000 esp null md5 1234567890ABCDEF1234567890ABCDEF
```

To enable ESP encryption, but not apply an AES-CBC key or a 3DES key, and SHA-1 authentication with a 40 hexadecimal character key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link
10.0.0.1 encryption ipsec spi 1000 esp null sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To enable ESP encryption with a 32 hexadecimal character AES-CBC key and a 40 hexadecimal character SHA-1 authentication key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link 10.0.0.1 encryption
ipsec spi 1000 esp aes-cbc 1234567890ABCDEF1234567890ABCDEF
sha1 1234567890ABCDEF1234567890ABCDEF12345678
```

To enable ESP encryption with a 48 hexadecimal character 3DES key and a 40 hexadecimal character SHA-1 authentication key for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# area 1 virtual-link
10.0.0.1 encryption ipsec spi 1000 esp 3des
1234567890ABCDEF1234567890ABCDEF1234567890ABCDEF sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To disable authentication for virtual links in OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no area 1 virtual-link 10.0.0.1
authentication ipsec spi 1000
```

Related commands

- [area authentication ipsec spi](#)
- [area encryption ipsec spi esp](#)
- [area virtual-link authentication ipsec spi](#)
- [show ipv6 ospf virtual-links](#)

auto-cost reference bandwidth (IPv6 OSPF)

Overview This command controls how OSPF calculates default metrics for the interface.

Use the **no** variant of this command to assign cost based only on the interface bandwidth.

Syntax auto-cost reference-bandwidth <1-4294967>
no auto-cost reference-bandwidth

Parameter	Description
<1-4294967>	The reference bandwidth, measured in Mbits per second (Mbps).

Default 1000 Mbps

Usage notes By default, OSPF calculates the OSPF metric for an interface by dividing the reference bandwidth by the interface bandwidth. The default for the reference bandwidth is 1000 Mbps. As a result, if this default is used, there is very little difference between the metrics applied to interfaces of increasing bandwidth beyond 1000 Mbps.

The auto-cost command is used to alter this reference bandwidth in order to give a real difference between the metrics of high bandwidth links of differing bandwidths. In a network that has multiple links with high bandwidths, specify a larger reference bandwidth value to differentiate the costs on those links.

Cost is calculated by dividing the reference bandwidth (Mbps) by the layer 3 interface (Switched Virtual Interface (SVI), Loopback or Ethernet interface) bandwidth. Interface bandwidth may be altered by using the **bandwidth** as the SVI does not auto-detect the bandwidth based on the speed of associated device ports.

When the reference bandwidth calculation results in a cost integer greater than 1 but contains a fractional value (the value after the decimal point), the result rounds down to the nearest integer. The following example shows how the cost is calculated.

The reference bandwidth is 1000 Mbps and the interface bandwidth is 7 Mbps.

Calculation = $1000/7$

Calculation result = 142.85 (integer of 142, fractional value of 0.85)

Result after rounding down to the nearest integer = 142 (Interface cost is 142)

When the reference bandwidth calculation results in a cost less than 1, it is rounded up to the nearest integer which is 1. The following example shows how the cost is calculated.

The reference bandwidth is 1000 Mbps and the interface bandwidth is 10000 Mbps.

Calculation = $1000/10000$

Calculation result = 0.1

Result after rounding up to the nearest integer = 1 (Interface cost is 1)

The auto-cost reference bandwidth value should be consistent across all OSPF routers in the OSPF process.

Note that using the **ipv6 ospf cost** command on a layer 3 interface will override the cost calculated by this command.

Mode Router Configuration

Example

```
awplus# configure terminal
awplus(config)# router ipv6 ospf 20
awplus(config-router)# auto-cost reference-bandwidth 1000
```

Related [**ipv6 ospf cost**](#)
commands

bandwidth

Overview Use this command to specify the maximum bandwidth to be used for each interface. The bandwidth value is in bits per second. OSPF uses this to calculate metrics for the interface.

The **no** variant of this command removes any applied bandwidth value. It replaces it with a value equal to the lowest port speed within that VLAN.

Syntax `bandwidth <bandwidth-setting>`
`no bandwidth`

Parameter	Description
<code><bandwidth-setting></code>	Sets the bandwidth for the interface. Enter a value in the range 1 to 10000000000 bits per second. Note that to avoid entering many zeros, you can add k, m, or g to internally add 3, 6 or 9 zeros to the number entered. For example entering 1k is the same as entering 1000.

Mode Interface Configuration for a VLAN interface.

Example To set the bandwidth on VLAN2 to be 10 Mbps, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# bandwidth 100000000
or
awplus(config-if)# bandwidth 10m
```

Related commands [show running-config access-list](#)
[show interface](#)

clear ipv6 ospf process

Overview This command clears and restarts the IPv6 OSPF routing process. Specify the Process ID to clear one particular OSPF process. When no Process ID is specified, this command clears all running OSPF processes.

Syntax `clear ipv6 ospf [<0-65535>] process`

Parameter	Description
<0-65535>	The routing process ID.

Mode Privileged Exec

Example `awplus# clear ipv6 ospf process`

debug ipv6 ospf events

Overview This command enables IPv6 OSPF debugging for event troubleshooting. To enable all debugging options, specify **debug ipv6 ospf event** with no additional parameters.

The **no** and **undebug** variants of this command disable OSPF debugging. Using this command with no parameters entered, will disable debugging for all parameter options.

Syntax debug ipv6 ospf events [abr] [asbr] [os][router] [vlink]
no debug ipv6 ospf events [abr] [asbr] [os] [router] [vlink]

Parameter	Description
abr	Shows ABR events.
asbr	Shows ASBR events.
router	Shows other router events.
os	Shows OS events.
vlink	Shows virtual link events.

Mode Privileged Exec and Global Configuration

Example To enable IPv6 event debugging and show ABR events, use the following command:

```
awplus# debug ipv6 ospf events asbr
```

debug ipv6 ospf ifsm

Overview This command specifies debugging options for IPv6 OSPF Interface Finite State Machine (IFSM) troubleshooting.

To enable all debugging options, specify **debug ipv6 ospf ifsm** with no additional parameters.

The **no** and **undebug** variants of this command disable IPv6 OSPF IFSM debugging. Use these commands without parameters to disable all the options.

Syntax `debug ipv6 ospf ifsm [events] [status] [timers]`
`no debug ipv6 ospf ifsm [events] [status] [timers]`

Parameter	Description
events	Displays IFSM event information.
status	Displays IFSM status information.
timers	Displays IFSM timer information.

Mode Privileged Exec and Global Configuration

Example To specify IPv6 OSPF debugging options to display IPv6 OSPF IFSM events information, use the following commands:

```
awplus# debug ipv6 ospf ifsm events
```

Related commands [terminal monitor](#)
[undebug ipv6 ospf ifsm](#)

debug ipv6 ospf lsa

Overview This command enables debugging options for IPv6 OSPF Link State Advertisements (LSA) troubleshooting. This displays information related to internal operations of LSAs.

To enable all debugging options, specify **debug ipv6 ospf lsa** with no additional parameters.

The **no** and **undebug** variants of this command disable IPv6 OSPF LSA debugging. Use this command without parameters to disable all the options.

Syntax debug ipv6 ospf lsa [flooding] [generate] [install] [maxage] [refresh]
no debug ipv6 ospf lsa [flooding] [generate] [install] [maxage] [refresh]

Parameter	Description
flooding	Displays LSA flooding.
generate	Displays LSA generation.
install	Show LSA installation.
maxage	Shows maximum age of the LSA in seconds.
refresh	Displays LSA refresh.

Mode Privileged Exec and Global Configuration

Examples To enable debugging for IPv6 OSPF refresh LSA, use the following commands:

```
awplus# debug ipv6 ospf lsa refresh
```

Related commands [terminal monitor](#)
[undebug ipv6 ospf lsa](#)

debug ipv6 ospf nfsm

Overview This command enables debugging options for IPv6 OSPF Neighbor Finite State Machines (NFSMs).

To enable all debugging options, specify **debug ipv6 ospf nfsm** with no additional parameters.

The **no** and **undebug** variants of this command disable IPv6 OSPF NFSM debugging. Use this command without parameters to disable all the options.

Syntax debug ipv6 ospf nfsm [events] [status] [timers]
no debug ipv6 ospf nfsm [events] [status] [timers]

Parameter	Description
events	Displays NFSM event information.
status	Displays NFSM status information.
timers	Displays NFSM timer information.

Mode Privileged Exec and Global Configuration

Examples To enable IPv6 debugging option to display timer information, use the following command:

```
awplus# debug ipv6 ospf nfsm timers
```

Related commands [terminal monitor](#)
[undebug ipv6 ospf nfsm](#)

debug ipv6 ospf packet

Overview This command enables debugging options for IPv6 OSPF packets.

To enable all debugging options, specify **debug ipv6 ospf packet** with no additional parameters.

The **no** and **undebug** variants of this command disable IPv6 OSPF packet debugging. Use this command without parameters to disable all options.

Syntax debug ipv6 ospf packet [dd] [detail] [hello] [ls-ack] [ls-request] [ls-update] [recv] [send]
no debug ipv6 ospf packet [dd] [detail] [hello] [ls-ack] [ls-request] [ls-update] [recv] [send]

Parameter	Description
dd	Specifies debugging for IPv6 OSPF database descriptions.
detail	Sets the debug option to detailed information.
hello	Specifies debugging for IPv6 OSPF hello packets.
ls-ack	Specifies debugging for IPv6 OSPF link state acknowledgments.
ls-request	Specifies debugging for IPv6 OSPF link state requests.
ls-update	Specifies debugging for IPv6 OSPF link state updates.
recv	Specifies the debug option set for received packets.
send	Specifies the debug option set for sent packets.

Mode Privileged Exec and Global Configuration

Examples To enable debugging for hello packets, use the following command:

```
awplus# debug ipv6 ospf packet hello
```

Related commands [terminal monitor](#)
[undebug ipv6 ospf packet](#)

debug ipv6 ospf route

Overview This command enables debugging of route calculation. Use this command without parameters to turn on all the options.

The **no** and **undebug** variants of this command disable IPv6 OSPF route debugging. Use this command without parameters to disable all options.

Syntax debug ipv6 ospf route [ase] [ia] [install] [spf]
no debug ipv6 ospf route [ase] [ia] [install] [spf]

Parameter	Description
ase	Specifies the debugging of external route calculation.
ia	Specifies the debugging of inter-area route calculation.
install	Specifies the debugging of route installation.
spf	Specifies the debugging of SPF calculation.

Mode Privileged Exec and Global Configuration

Examples To enable IPv6 route debugging of inter-area route calculations, use the following command:

```
awplus# debug ipv6 ospf route ia
```

Related commands [terminal monitor](#)
[undebug ipv6 ospf route](#)

default-information originate

Overview This command creates a default external route into an OSPF routing domain.

When you use the **default-information originate** command to redistribute routes into an OSPF routing domain, then the system acts like an Autonomous System Boundary Router (ASBR). By default, an ASBR does not generate a default route into the OSPF routing domain.

When using this command, also specify the **route-map <route-map>** option to avoid a dependency on the default network in the routing table.

The **metric-type** is an external link type associated with the default route advertised into the OSPF routing domain. The value of the external route could be either Type 1 or 2. The default is Type 2.

The **no** variant of this command disables this feature.

Syntax `default-information originate [always]
[metric <metric>] [metric-type <1-2>] [route-map <route-map>]
no default-information originate [always] [metric] [metric-type]
[route-map]`

Parameter	Description
<code>always</code>	Used to advertise the default route regardless of whether there is a default route.
<code><metric></code>	The metric value used in creating the default route. Enter a value in the range 0 to 16777214. The default metric value is 10. The value used is specific to the protocol.
<code><1-2></code>	External metric type for default routes, either OSPF External Type 1 or Type 2 metrics. Enter the value 1 or 2.
<code>route-map</code>	Specifies to use a specific route-map.
<code><route-map></code>	The route-map name. It is a string comprised of any characters, numbers or symbols.

Mode Router Configuration

Example

```
awplus# configure terminal
awplus(config)# router ospf 100
awplus(config-router)# default-information originate always
metric 23 metric-type 2 route-map myinfo
```

Related **route-map**
commands

default-metric (IPv6 OSPF)

Overview This command sets default metric value for routes redistributed into the IPv6 OSPF routing protocol.

The **no** variant of this command returns IPv6 OSPF to using built-in, automatic metric translations, as appropriate for each routing protocol.

Syntax `default-metric <0-16777214>`
`no default-metric [<0-16777214>]`

Parameter	Description
<1-16777214>	Default metric value appropriate for the specified routing protocol.

Mode Router Configuration

Usage notes A default metric facilitates redistributing routes even with incompatible metrics. If the metrics do not convert, the default metric provides an alternative and enables the redistribution to continue. The effect of this command is that IPv6 OSPF will use the same metric value for **all** redistributed routes. Use this command in conjunction with the **redistribute (IPv6 OSPF)** command.

Examples

```
awplus# configure terminal
awplus(config)# router ipv6 ospf 100
awplus(config-router)# default-metric 100
awplus# configure terminal
awplus(config)# router ipv6 ospf 100
awplus(config-router)# no default-metric
```

Related commands **redistribute (IPv6 OSPF)**

distance (IPv6 OSPF)

Overview This command sets the administrative distance for OSPFv3 routes based on the route type. Your device uses this value to select between two or more routes to the same destination from two different routing protocols. The route with the smallest administrative distance value is added to the Forwarding Information Base (FIB). See the [OSPFv3 Feature Overview and Configuration Guide](#) for more information.

Use the command **distance ospfv3** to set the distance for an entire category of OSPFv3 routes, rather than the specific routes that pass an access list.

Use the command **distance <1-254>**, with no other parameter, to set the same distance for all OSPFv3 route types.

The **no** variant of this command sets the administrative distance for OSPFv3 routes to the default of 110.

Syntax distance <1-254>
distance ospfv3 {external <1-254>|inter-area <1-254>|intra-area <1-254>}
no distance {ospfv3|<1-254>}

Parameter	Description
<1-254>	Specify the Administrative Distance value for OSPFv3 routes.
external	Sets the distance for routes from other routing domains, learned by redistribution. Specify an OSPFv3 external distance in the range <1-254>.
inter-area	Sets the distance for all routes from one area to another area. Specify an OSPFv3 inter-area distance in the range<1-254>.
intra-area	Sets the distance for all routes within an area. Specify an OSPFv3 intra-area distance in the range <1-254>.

Default The default OSPFv3 administrative distance is 110. The default Administrative Distance for each type of route (intra, inter, or external) is 110.

Mode Router Configuration

Usage notes The administrative distance rates the trustworthiness of a routing information source. The distance could be any integer from 0 to 254. A higher distance value indicates a lower trust rating. For example, an administrative distance of 254 indicates that the routing information source cannot be trusted and should be ignored.

Use this command to set the distance for an entire group of routes, rather than a specific route that passes an access list.

Examples To set the following administrative distances for route types in OSPF 100:

- 20 for inter-area routes
- 10 for intra-area routes
- 40 for external routes

use the commands:

```
awplus(config)# router ipv6 ospf 100
awplus(config-router)# distance ospfv3 inter-area 20 intra-area
10 external 40
```

To set the administrative distance for all routes in OSPFv3 100 back to the default of 110, use the commands:

```
awplus(config)# router ipv6 ospf 100
awplus(config-router)# no distance ospfv3
```

distribute-list (IPv6 OSPF)

Overview Use this command to apply filtering to the transfer of routing information between OSPFv3 and the IPv6 route table.

The entities that are used to perform filtering are ACLs (Access Control Lists), which match on certain attributes in the routes that are being transferred. For information about ACLs, see the [ACL Feature Overview and Configuration Guide](#).

Use the **no** variant of this command to disable this feature for networks as defined in an associated access-list.

Syntax `distribute-list <access-list> in`
`no distribute-list [<access-list>] in`
`distribute-list <access-list> out {connected|ospf [<process-tag>]|rip|static}`
`no distribute-list <access-list> out {connected|ospf [<process-tag>]|rip|static}`

Parameter	Description
<code><access-list></code>	Specifies the IPv6 access-list number or name to use. The specified access list defines which networks are received and which are suppressed.
<code>in</code>	Indicates that this applies to incoming advertised routes.
<code>out</code>	Indicates that this applies to outgoing advertised routes.
<code>connected</code>	Specify the redistribution of connected routes.
<code>ospf</code>	Specify the redistribution of OSPFv3 routes.
<code><process-tag></code>	Optionally specify an OSPFv3 process tag for OSPFv3 routes.
<code>rip</code>	Specify the redistribution of RIPng routes.
<code>static</code>	Specify the redistribution of connected routes.

Default Disabled

Mode Router Configuration

Usage notes This command applies filtering to the transfer of routing information between OSPFv3 and the IPv6 route table. You can apply filtering in either direction, from OSPFv3 to the IPv6 route table using an **in** distribute-list, or from the IPv6 route table to OSPFv3 using an **out** distribute-list.

The effect of an **in** filter is that some route information that OSPFv3 has learned from LSA updates will not be installed into the IPv6 route table. The effect of an **out** filter is that some route information that could be redistributed to OSPFv3 will not be redistributed to OSPFv3.

There are **in** and **out** distribute-lists, which carry out different route filtering activities:

- The **in** distribute list is applied to the process of installing OSPFv3 routes into the IPv6 route table. The SPF calculation generate a set of routes calculated from the LSA database. By default, all of these routes become OSPFv3 candidate routes for inclusion into the IPv6 route table.
- An **in** distribute-list can be used to control whether or not certain routes generated by the SPF calculation are included into the set of candidates for inclusion into the IP route table. Those routes that match **deny** entries in the distribute-list will not be considered for inclusion into the IPv6 route table.
- The **out** distribute-list applies the process of redistributing non-OSPFv3 routes into OSPFv3. If OSPFv3 redistribution is configured, and an **out** distribute-list is also configured, then routes that match deny entries in the distribute-list will not be redistributed into OSPFv3.

Example The below commands redistribute incoming route updates from networks defined with the standard named access-list called myacl:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard myacl permit
2001:db8:1::/64
awplus(config)# router ipv6 ospf
awplus(config-router)# distribute-list myacl in
```

The below commands redistribute outgoing connected route updates from networks defined with the standard named access-list called myacl:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard myacl permit
2001:db8:1::/64
awplus(config)# router ipv6 ospf
awplus(config-router)# distribute-list myacl out connected
```

The below commands disable incoming route updates from networks defined with the standard named access-list called myacl:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no distribute-list myacl in
```

The below commands disable outgoing connected route updates from networks defined with the standard named access-list called myacl:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no distribute-list myacl out connected
```

Related commands [ipv6 access-list extended \(named\)](#)
[ipv6 access-list standard \(named\)](#)

ipv6 ospf authentication spi

Overview Use this command in Interface Configuration mode to enable either MD5 (Message-Digest 5) or SHA1 (Secure Hash Algorithm 1) authentication for a specified interface.

Use the **no** variant of this command in Interface Configuration mode to disable the authentication configured for a specified interface.

Syntax `ipv6 ospf authentication ipsec spi <256-4294967295> {md5 <MD5-key>|sha1 <SHA1-key>}`
`ipv6 ospf authentication null`
`no ipv6 ospf authentication ipsec spi <256-4294967295>`

Parameter	Description
<code>authentication</code>	Specify this keyword to enable authentication.
<code>ipsec</code>	Specify this keyword to use IPsec authentication.
<code>spi</code>	Specify this keyword to set the SPI (Security Parameters Index).
<code><256-4294967295></code>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
<code>md5</code>	Specify the MD5 (Message-Digest 5) hashing algorithm.
<code><MD5-key></code>	Enter an MD5 key containing up to 32 hexadecimal characters.
<code>sha1</code>	Specify the SHA-1 (Secure Hash Algorithm 1) hashing algorithm.
<code><SHA1-key></code>	Enter an SHA-1 key containing up to 40 hexadecimal characters.
<code>null</code>	Specify no authentication is applied when no other parameters are applied after this keyword (<code>ipv6 ospf authentication null</code>). Note this overrides any existing area authentication configured.

Default Authentication is not configured on an interface by default.

Mode Interface Configuration for a VLAN interface.

Usage notes Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

Use the **null** keyword to override existing area authentication. Apply the **null** keyword if area authentication is already configured to configure authentication on an interface.

See the [OSPFv3 Feature Overview and Configuration Guide](#) for more information and examples.

NOTE: *You can configure an authentication security policy (SPI) on an interface with this command, or an OSPFv3 area with the command.*

When you configure authentication for an area, the security policy is applied to all interfaces in the area. Allied Telesis recommends a different authentication security policy is applied to each interface for higher security.

*If you apply the **ipv6 ospf authentication null** command, this affects authentication configured on both the interface and the OSPFv3 area.*

This is due to OSPFv3 hello messages ingressing interfaces, which are part of area authentication, not being authenticated. So neighbors time out.

Example To enable SHA-1 authentication with a 40 hexadecimal character key for interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf authentication ipsec spi 1000 sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To specify no authentication is applied to interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf authentication null
```

To disable authentication for interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 ospf authentication ipsec spi 1000
```


Related commands **area authentication ipsec spi**
area encryption ipsec spi esp
ipv6 ospf encryption spi esp
show ipv6 ospf interface

ipv6 ospf cost

Overview This command explicitly specifies the cost of the link-state metric in a router-LSA.

The interface cost indicates the overhead required to send packets across a certain interface. Use this command to set the interface cost manually.

The **no** variant of this command resets the interface cost to the default.

Syntax `ipv6 ospf cost <1-65535>`
`no ipv6 ospf cost`

Parameter	Description
<1-65535>	The link-state metric.

Default By default there is no static value set and the OSPF cost is automatically calculated by using the command **auto-cost reference bandwidth (IPv6 OSPF)**.

Mode Interface Configuration for a VLAN interface.

Usage notes This command explicitly sets a user specified cost of sending packets out the interface. Using this command overrides the cost value calculated automatically with the auto-cost reference bandwidth (IPv6 OSPF) feature.

The link-state metric cost is stated in the Router-LSA's link. Typically, the cost is inversely proportional to the bandwidth of an interface. By default, the cost of an interface is calculated according to the following formula:

$$\text{reference bandwidth} / \text{interface bandwidth}$$

The reference bandwidth is set by default at 1000000 kbps (or 1000 Mbps), but can be changed by the command **auto-cost reference bandwidth (IPv6 OSPF)**.

The interface bandwidth is set by default to 1000000 kbps (or 1000 Mbps), but can be changed by the **bandwidth** command.

Example To set the IPv6 OSPF cost to 10 on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf cost 10
```

Related commands **show ipv6 ospf interface**
auto-cost reference bandwidth (IPv6 OSPF)
bandwidth

ipv6 ospf dead-interval

Overview This command sets the interval during which no hello packets are received and after which a neighbor is declared dead.

The dead-interval is the amount of time that OSPF waits to receive an OSPF hello packet from the neighbor before declaring the neighbor is down. This value is advertised in the router's hello packets. It must be a multiple of the hello-interval and be the same for all routers on a specific network.

The **no** variant of this command returns the interval to the default of 40 seconds.

Syntax `ipv6 ospf dead-interval <1-65535> [<inst-id>]`
`no ipv6 ospf dead-interval`

Parameter	Description
<1-65535>	The interval in seconds. Default: 40
<inst-id>	The instance ID Default: 0

Mode Interface Configuration for a VLAN interface.

Default 40 seconds.

Example The following example shows configuring the dead-interval to 10 seconds on the VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf dead-interval 10
```

Related commands [ipv6 ospf hello-interval](#)
[show ipv6 ospf interface](#)

ipv6 ospf display route single-line

Overview Use this command to change the result of the **show ipv6 route** command to display each route entry on a single line.

Syntax `ipv6 ospf display route single-line`
`no ipv6 ospf display route single-line`

Mode Global Configuration

Example To display each route entry on a single line.

```
awplus# configure terminal
awplus(config)# ipv6 ospf display route single-line
```

Related commands [show ipv6 ospf route](#)

ipv6 ospf encryption spi esp

Overview Use this command in Interface Configuration mode to enable either AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) or 3DES (Triple Data Encryption Standard) ESP (Encapsulating Security Payload) encryption for a specified interface.

Use the **no** variant of this command in Interface Configuration mode to disable the encryption configured for a specified interface.

Syntax `ipv6 ospf encryption ipsec spi <256-4294967295> esp {aes-cbc <AES-CBC-key>|3des <3DES-key>|null} {md5 <MD5-key>|sha1 <SHA1-key>}`
`ipv6 ospf encryption null`
`no ipv6 ospf encryption ipsec spi <256-4294967295>`

Parameter	Description
<256-4294967295>	Specify an SPI (Security Parameters Index) value in the range 256 to 4294967295, entered as a decimal integer.
esp	Specify the esp keyword (Encapsulating Security Payload) to then apply either AES-CBC or 3DES encryption.
aes-cbc	Specify this keyword to enable AES-CBC (Advanced Encryption Standard-Cipher Block Chaining) encryption.
<AES-CBC-key>	Enter an AES-CBC key containing either 32, 48, or 64 hexadecimal characters.
3des	Specify 3DES (Triple Data Encryption Standard) encryption.
<3DES-key>	Enter a 3DES key containing 48 hexadecimal characters.
null	Specify ESP without AES-CBC or 3DES encryption applied.
md5	Specify the MD5 (Message-Digest 5) encryption algorithm.
<MD5-key>	Enter an MD5 key containing 32 hexadecimal characters.
sha1	Specify the SHA-1 (Secure Hash Algorithm 1) encryption algorithm.
<SHA1-key>	Enter an SHA-1 key containing 40 hexadecimal characters.
null	Specify no encryption is applied when no other parameters are applied after this keyword (<code>ipv6 ospf encryption null</code>).

Default Authentication is not configured on an interface by default.

Mode Interface Configuration for a VLAN interface.

Usage notes When you issue this command, authentication and encryption are both enabled. Configure the same SPI (Security Parameters Index) value on all interfaces that connect to the same link. SPI values are used by link interfaces. Use a different SPI value for a different link interface when using OSPFv3 with link interfaces.

Security is achieved using the IPv6 ESP extension header. The IPv6 ESP extension header is used to provide confidentiality, integrity, authentication, and confidentiality. Authentication fields are removed from OSPF for IPv6 packet headers, so applying IPv6 ESP extension headers are required for integrity, authentication, and confidentiality.

Use the **null** keyword to override existing area encryption. Apply the **null** keyword if area encryption is already configured to then configure encryption on an interface instead.

Use the **sha1** keyword to choose SHA-1 authentication instead of entering the **md5** keyword to use MD5 authentication. The SHA-1 algorithm is more secure than the MD5 algorithm. SHA-1 uses a 40 hexadecimal character key instead of a 32 hexadecimal character key as used for MD5 authentication.

See the **OSPFv3 Feature Overview and Configuration Guide** for more information and examples.

NOTE: You can configure an encryption security policy (SPI) on an interface with this command, or an OSPFv3 area with the command.

When you configure encryption for an area, the security policy is applied to all interfaces in the area. Allied Telesis recommends a different encryption security policy is applied for each interface for higher security.

If you apply the **ipv6 ospf encryption null** command this affects encryption configured on both the interface and the OSPFv3 area.

This is due to OSPFv3 hello messages ingressing interfaces, which are part of area encryption, not being encrypted. So neighbors time out.

Example To enable ESP encryption but not apply an AES-CBC key or a 3DES key, for interface VLAN 2 and SHA-1 authentication with a 40 hexadecimal character key, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf encryption ipsec spi 1000 esp null
sha1 1234567890ABCDEF1234567890ABCDEF12345678
```

To enable ESP encryption with an AES-CBC key with a 32 hexadecimal character key and SHA-1 authentication with a 40 hexadecimal character key for interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf encryption ipsec spi 1000
esp aes-cbc 1234567890ABCDEF1234567890ABCDEF sha1
1234567890ABCDEF1234567890ABCDEF12345678
```

To specify no ESP encryption is applied to interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf encryption null
```

To disable ESP encryption for interface VLAN 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 ospf encryption ipsec spi 1000
```

Related commands

- [area authentication ipsec spi](#)
- [area encryption ipsec spi esp](#)
- [ipv6 ospf authentication spi](#)
- [show ipv6 ospf interface](#)

ipv6 ospf hello-interval

Overview This command specifies the interval between hello packets.

The hello-interval is advertised in the hello packets. Configure the same hello-interval for all routers on a specific network. A shorter interval ensures faster detection of topological changes, but results in more routing traffic.

The **no** variant of this command returns the interval to the default of 10 seconds.

Syntax `ipv6 ospf hello-interval <1-65535>`
`no ipv6 ospf hello-interval`

Parameter	Description
<1-65535>	The hello-interval in seconds. Default: 10

Default The default interval is 10 seconds.

Mode Interface Configuration for a VLAN interface.

Example The following example shows setting the hello-interval to 3 seconds on the VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf hello-interval 3
```

Related commands [ipv6 ospf dead-interval](#)
[show ipv6 ospf interface](#)

ipv6 ospf neighbor

Overview Use this command to configure static OSPFv3 IPv6 neighbors when using the OSPFv3 "non-broadcast" (NBMA) and "point-to-multipoint non-broadcast" (P2MP NBMA) network types. OSPFv3 messages exchanged between the neighbors are unicast only.

Use the **no** variant of this command to remove a configuration.

Syntax `ipv6 ospf neighbor <ipv6-address> [<cost>|<instance-id>|<poll-interval>|<priority>]`
`no ipv6 ospf neighbor <ipv6-address> [<cost>|<instance-id>|<poll-interval>|<priority>]`

Parameter	Description
<code><ipv6-address></code>	Specifies the interface IPv6 address of the neighbor.
<code><cost></code>	<i>cost <1-65535></i> OSPF cost for point-to-multipoint neighbor.
<code><instance-id></code>	<i>instance-id <0-255></i> Interface instance ID.
<code><poll-interval></code>	<i>poll-interval <0-4294967295></i> Dead neighbor polling interval in seconds. It is recommended to set this value much higher than the hello interval. The default is 120 seconds.
<code><priority></code>	<i>priority <0-255></i> Specifies the router priority value of the non-broadcast neighbor associated with the specified IP address. The default is 0. This keyword does not apply to point-to-multipoint interfaces.

Mode Interface Configuration for a VLAN interface.

Usage notes To configure a neighbor on an NBMA network manually, use the **ipv6 ospf neighbor** command and include one neighbor entry for each known non-broadcast network neighbor. The IPv6 address used in this command is the neighbor's primary IPv6 address on the interface where that neighbor connects to the NBMA network.

The poll interval is the reduced rate at which routers continue to send hello packets, when a neighboring router has become inactive. Set the poll interval to be much larger than the hello interval.

Examples To configure a neighbor with a priority value, poll interval time, and cost, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf neighbor fe80::c:20:0:1 priority 1
poll-interval 90
awplus(config-router)# ipv6 ospf neighbor fe80::c:20:0:1 cost 15
```

Related commands [show ipv6 ospf neighbor](#)

ipv6 ospf network

Overview This command configures the OSPF network type to a type different from the default for the particular interface.

The **no** variant of this command returns the network type to the default for the particular interface.

Syntax `ipv6 ospf network {broadcast|non-broadcast|point-to-point|point-to-multipoint}`
`no ipv6 ospf network`

Parameter	Description
broadcast	Sets the network type to broadcast.
non-broadcast	Sets the network type to NBMA.
point-to-multipoint	Sets the network type to point-to-multipoint.
point-to-point	Sets the network type to point-to-point.

Default The default is the default type for the interface, e.g broadcast for VLANs.

Mode Interface Configuration for a VLAN interface.

Usage notes This command forces the interface network type to be the specified type. Depending on the network type, OSPF changes the behavior of the packet transmission and the link description in LSAs.

Example The following example shows setting the network type to point-to-point on the VLAN interface vlan1:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ipv6 ospf network point-to-point
```

ipv6 ospf priority

Overview This command sets the router priority, which is a parameter used in the election of the designated router for the link.

The **no** variant of this command returns the router priority to the default of 1.

Syntax `ipv6 ospf priority <priority>`
`no ipv6 ospf priority`

Parameter	Description
<code><priority></code>	<code><0-255></code> Specifies the router priority of the interface. The larger the value, the greater the priority level. The value 0 defines that the device cannot become either the DR, or backup DR for the link.

Default The default priority is 1.

Mode Interface Configuration for a VLAN interface.

Usage Set the priority to help determine the OSPF Designated Router (DR) for a link. If two routers attempt to become the DR, the router with the higher router priority becomes the DR. If the router priority is the same for two routers, the router with the higher router ID takes precedence.

Routers with zero router priority values cannot become the designated or backup designated router.

Example The following example shows setting the OSPFv3 priority value to 3 on the VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf priority 3
```

ipv6 ospf retransmit-interval

Overview Use this command to specify the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface.

Use the **no** variant of this command to return to the default of 5 seconds.

Syntax `ipv6 ospf retransmit-interval <1-65535>`
`no ipv6 ospf retransmit-interval`

Parameter	Description
<1-65535>	Specifies the interval in seconds.

Default The default interval is 5 seconds.

Mode Interface Configuration for a VLAN interface.

Usage After sending an LSA to a neighbor, the router keeps the LSA until it receives an acknowledgment. In case the router does not receive an acknowledgment during the set time (the retransmit interval value) it retransmits the LSA. Set the retransmission interval value conservatively to avoid needless retransmission. The interval should be greater than the expected round-trip delay between two routers.

Example The following example shows setting the OSPF retransmit interval to 6 seconds on the VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf retransmit-interval 6
```

ipv6 ospf transmit-delay

Overview Use this command to set the estimated time it takes to transmit a link-state-update packet on the interface.

Use the **no** variant of this command to return to the default of 1 second.

Syntax `ipv6 ospf transmit-delay <1-65535>`
`no ipv6 ospf transmit-delay`

Parameter	Description
<code><1-65535></code>	Specifies the time, in seconds, to transmit a link-state update.

Default The default interval is 1 second.

Mode Interface Configuration for a VLAN interface.

Usage The transmit delay value adds a specified time to the age field of an update. If the delay is not added, the time in which the LSA transmits over the link is not considered. This command is especially useful for low speed links. Add transmission and propagation delays when setting the transmit delay value.

Example To set the IPv6 OSPF transmit delay time to 3 seconds on the VLAN interface `vlan2`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 ospf transmit-delay 3
```

ipv6 router ospf area

Overview Use this command to enable IPv6 OSPF routing on an interface.
Use the **no** variant of this command to disable IPv6 OSPF routing on an interface.

Syntax `ipv6 router ospf area <area-id> [tag <process-id>] [instance <instance-id>]`
`no ipv6 router ospf area <area-id>`

Parameter	Other parameter descriptions
tag <process-id>	The process tag denotes a separate router process. It can comprise any string of alphanumeric characters. Note that this tag is local to the router on which it is set and does not appear in any OSPF packets or LSA.
instance <instance-id>	The OSPF instance ID, entered as an integer between 0 and 255. This is the value that will appear in the instance field of the IPv6 OSPF hello packet.

Defaults IPv6 OSPF routing is disabled by default.

When enabling IPv6 OSPF routing:

- the process-tag will default to a null value if not set.
- the Instance ID defaults to 0 if not set.

Mode Interface Configuration for a VLAN interface.

Usage notes When enabling IPv6 OSPF routing on an interface, specifying the area-ID is mandatory, but the Process tag and Instance are optional.

See the [OSPFv3 Feature Overview and Configuration Guide](#) for more information and examples.

Examples To enable IPv6 OSPF on VLAN interface vlan2 in OSPF area 1, with a tag of 'PT2', and instance 2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 router ospf area 1 tag PT2 instance-id
2
```

To disable IPv6 OSPF on VLAN interface vlan2 and OSPF area 1, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 router ospf area 1
```

max-concurrent-dd (IPv6 OSPF)

Overview Use this command to limit the number of neighbors that can be concurrently processed in the database exchange. The specified value limits the number of neighbors from all interfaces, not per interface.

Use the **no** variant of this command to have no limit on the maximum number of LSAs.

Syntax max-concurrent-dd <max-neighbors>
no max-concurrent-dd

Parameter	Description
<max-neighbors>	<1-65535> The maximum number of neighbors.

Mode Router Configuration

Usage notes This command is useful where bringing up several adjacencies on a router is affecting performance. In this situation, you can often enhance the system performance by limiting the number of neighbors that can be processed concurrently.

Example The following example sets the max-concurrent-dd value to allow only 4 neighbors to be processed at a time.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# max-concurrent-dd 4
```

Related commands [router ipv6 ospf](#)

passive-interface (IPv6 OSPF)

Overview Use this command to suppress the sending of Hello packets on a specified interface. If you use the **passive-interface** command without the optional parameters then all interfaces are put into passive mode.

Use the **no** variant of this command to allow the sending of Hello packets on all interfaces, or on the specified interface. If you use the **no** variant of this command without the optional parameters then all interfaces are removed from passive mode.

Syntax `passive-interface [<interface>]`
`no passive-interface [<interface>]`

Parameter	Description
<code><interface></code>	The name of the interface.

Mode Router Configuration

Usage Configure an interface to be passive if you wish its connected route to be treated as an OSPF route (rather than an AS-external route), but do not wish to actually exchange any OSPF packets via this interface.

Examples To configure passive interface mode on all interfaces, enter the following commands:

```
awplus(config)# router ipv6 ospf
awplus(config-router)# passive-interface
```

To configure passive interface mode on the local loopback interface, enter the following commands:

```
awplus(config)# router ipv6 ospf
awplus(config-router)# passive-interface lo
```

To remove passive interface mode from all interfaces, enter the following commands:

```
awplus(config)# router ipv6 ospf
awplus(config-router)# no passive-interface
```

redistribute (IPv6 OSPF)

Overview Use this command to redistribute routes from other routing protocols, static routes and connected routes into an IPv6 OSPF routing table.

Use the **no** variant of this command to disable this function.

Syntax redistribute <protocol> [metric <0-16777214>] [metric-type {1|2}] [route-map <route-map-entry>]
no redistribute <protocol>

Parameter	Description
<protocol>	The routing protocol to be redistributed, can be one of:
connected	Connected routes
rip	Routing Internet Protocol
static	Static Routes
metric	Specifies the external metric.
metric-type	Specifies the external metric-type, either type 1 or type 2. • For Metric Type 1: The best route is based on the external redistributed path cost plus the internal path cost presented by the native routing protocol. • For Metric Type 2: The best route is based only on the external redistributed path cost. The internal path cost is only used to break a "tie" situation between two identical external path costs.
route-map	The name of the specific route-map.

Default The default metric value for routes redistributed into OSPFv3 is 20. The metric can also be defined using the **set metric** command for a route map. Note that a metric defined using the **set metric** command for a route map overrides a metric defined with this command.

Mode Router Configuration

Usage notes You use this command to inject routes, learned from other routing protocols, into the OSPF domain to generate AS-external-LSAs. If a route-map is configured by this command, then that route-map is used to control which routes are redistributed and can set metric and tag values on particular routes.

The metric, metric-type, and tag values specified on this command are applied to any redistributed routes that are not explicitly given a different metric, metric-type, or tag value by the route map.

See the [OSPFv3 Feature Overview and Configuration Guide](#) for more information about metrics, and about behavior when configured in route maps.

Note that this command does not redistribute the default route. To redistribute the default route, use the [default-information originate](#) command.

Example The following example shows the redistribution of RIP routes into the IPv6 OSPF routing table, with a metric of 10 and a metric type of 1.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# redistribute rip metric 10 metric-type 1
```

restart ipv6 ospf graceful

Overview Use this command to force the OSPFv3 process to restart. You may optionally specify a grace-period value. If a grace-period is not specified then a default value of 120 seconds is applied.

You should specify a grace-period value of 120 seconds or more. Low grace-period values may cause the graceful restart process on neighboring routers to terminate with routes missing.

Syntax `restart ipv6 ospf graceful [grace-period <1-1800>]`

Parameter	Description
grace-period	Specify the grace period.
<1-1800>	The grace period in seconds.

Default The default OSPF grace-period is 120 seconds.

Mode Privileged Exec

Usage notes After this command is executed, the OSPFv3 process immediately shuts down. It notifies the system that OSPF has performed a graceful shutdown. Routes installed by OSPF are preserved until the grace-period expires.

When a **restart ospf graceful** command is issued, the OSPF configuration is reloaded from the last saved configuration. Ensure you first enter the **copy running-config startup-config** command.

Example To restart OSPFv3, use the following commands:

```
awplus# copy running-config startup-config
awplus# restart ipv6 ospf graceful grace-period 200
```

To apply the default grace-period (120 seconds), use the following commands:

```
awplus# copy running-config startup-config
awplus# restart ipv6 ospf graceful
```

router ipv6 ospf

Overview Use this command to create or remove an IPv6 OSPF routing process, or to enter the Router Configuration mode to configure a specific IPv6 OSPF routing process. Use the **no** variant of this command to terminate an IPv6 OSPF routing process.

Use the **no** parameter with the **process-id** parameter, to terminate and delete a specific IPv6 OSPF routing process.

Syntax router ipv6 ospf [*<process-id>*]
no router ipv6 ospf [*<process-id>*]

Parameter	Description
<i><process-id></i>	A character string that identifies a routing process. If you do not specify the process-id a "null" process ID will be applied. Note that this will appear in show output as *null* However you cannot select the null process by using the character string *null* as command entry characters.

Default No routing process is defined by default.

Mode Global Configuration

Usage notes The process ID enables you to run more than one OSPF session within the same router, then configure each session to a different router port. Note that this function is internal to the router, and other routers (neighbors) have no knowledge of these different processes. The hello and LSAs issued from each process will appear as if coming from a separate physical router.

To a large extent the requirement for multiple processes has been replaced by the ability within IPv6 OSPF of running simultaneous router instances.

The process ID of IPv6 OSPF is an optional parameter for the **no** variant of this command only. When removing all IPv6 OSPF processes on the device, you do not need to specify each Process ID, but when removing particular IPv6 OSPF processes, you must specify each Process ID to be removed.

For a description of processes and instances and their configuration relationships, see the [OSPFv3 Feature Overview and Configuration Guide](#).

Example This example shows the use of this command to enter Router Configuration mode.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf P100
awplus(config-router)#
```


router-id (IPv6 OSPF)

Overview Use this command to specify a router ID for the IPv6 OSPF process.
Use the **no** variant of this command to disable this function.

Syntax `router-id <router-id>`
`no router-id`

Parameter	Description
<code><router-id></code>	Specifies the router ID in IPv4 address format.

Mode Router Configuration

Usage Configure each router with a unique router-id. In an IPv6 OSPF router process that has active neighbors, a new router-id takes effect at the next reload or when you restart OSPF manually.

Example The following example shows a specified router ID 0.0.4.5.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# router-id 0.0.4.5
```

Related commands [show ipv6 ospf](#)

service ospf6

Overview Use this command to enable the OSPFv3 service for OSPF with IPv6.
Use the **no** version of the command to disable the OSPFv3 service if you are not using it.

Syntax service ospf6
no service ospf6

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using OSPF with IPv6. Enable it before configuring OSPF with IPv6.
If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the OSPFv3 service, use the commands:

```
awplus# configure terminal
awplus(config)# service ospf6
```

To disable the OSPFv3 service, use the commands:

```
awplus# configure terminal
awplus(config)# no service ospf6
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show debugging ipv6 ospf

Overview Use this command to see what debugging is turned on for OSPFv3. For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging ipv6 ospf

Mode User Exec and Privileged Exec

Example awplus# show debugging ipv6 ospf

Output The following shows typical output.

Example output from the show debugging ipv6 ospf command

```
OSPFv3 debugging status:
OSPFv3 all packet detail debugging is on
OSPFv3 all IFSM debugging is on
OSPFv3 all NFSM debugging is on
OSPFv3 all LSA debugging is on
OSPFv3 all NSM debugging is on
OSPFv3 all route calculation debugging is on
OSPFv3 all event debugging is on
```

show ipv6 ospf

Overview Use this command in User Exec or Privileged Exec modes to display general information about all IPv6 OSPF routing processes, including OSPFv3 Authentication configuration and status information.

Include the process ID parameter with this command to display information about specified processes.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 ospf
show ipv6 ospf <process-id>

Parameter	Description
<process-id>	<0-65535> The ID of the router process for which information will be displayed. If this parameter is included, only the information for the specified routing process is displayed.

Mode User Exec and Privileged Exec

Examples To display general information about all IPv6 OSPF routing processes, use the command:

```
awplus# show ipv6 ospf
```

To display general information about IPv6 OSPF (OSPFv3) routing process P10, use the command:

```
awplus# show ipv6 ospf P10
```

Output The following shows typical output.

Example output from the show ipv6 ospf command for process P10, showing OSPFv3 Authentication configuration information highlighted in bold

```
awplus#show ipv6 ospf
Routing Process "OSPFv3 (10)" with ID 192.168.1.2
Route Licence: Route : Limit=Unlimited, Allocated=0, Visible=0,
Internal=0
Route Licence: Breach: Current=0, Watermark=0
Process uptime is 6 minutes
Current grace period is 120 secs (default)
SPF schedule delay min 0.500 secs, SPF schedule delay max 50.0
secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 4
Number of LSA received 10
Number of areas in this router is 1
  Area BACKBONE(0)
    Number of interfaces in this area is 1(1)
    MD5 Authentication SPI 1000
    NULL Encryption SHA-1 Auth, SPI 1001
    SPF algorithm executed 9 times
    Number of LSA 3. Checksum Sum 0xF9CC
    Number of Unknown LSA 0
```

Related commands [area authentication ipsec spi](#)
[area encryption ipsec spi esp](#)
[router ipv6 ospf](#)

show ipv6 ospf database

Overview Use this command in User Exec or Privileged Exec modes to display a database summary for IPv6 OSPF information. Include the process ID parameter with this command to display information about specified processes.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ipv6 ospf <process-id> database [self-originate|max-age|adv router <adv-router-id>]`

Parameter	Description
<process-id>	<0-65535> The ID of the router process for which information will be displayed.
self-originate	Displays self-originated link states.
max-age	Displays LSAs in MaxAge list. It maintains the list of the all LSAs in the database which have reached the max-age which is 3600 seconds.
adv-router	Advertising Router LSA.
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.

Mode User Exec and Privileged Exec

Example To display the database summary for IPv6 OSPF information on process P10, use the command:

```
awplus# show ipv6 ospf P10 database
```

Output The following shows typical output.

Example output from the show ipv6 ospf P10 database command

OSPFv3 Router with ID (0.0.1.1) (Process P10)							
Link-LSA (Interface vlan2)							
Link State ID	ADV Router	Age	Seq#	CkSum	Prefix		
0.0.0.202	0.0.1.1	46	0x800000c3	0x5f50	1		
0.0.0.202	0.0.1.2	8	0x800000c3	0x4ca0	1		
Link-LSA (Interface vlan3)							
Link State ID	ADV Router	Age	Seq#	CkSum	Prefix		
0.0.0.203	0.0.1.1	1071	0x8000000e	0xe082	1		
0.0.0.203	0.0.1.3	1057	0x8000000e	0xb8aa	1		
Router-LSA (Area 0.0.0.0)							
Link State ID	ADV Router	Age	Seq#	CkSum	Link		
0.0.0.0	0.0.1.1	1016	0x800000cd	0xa426	2		
0.0.0.0	0.0.1.2	979	0x800000d8	0xad2b	1		
0.0.0.0	0.0.1.3	1005	0x800000cf	0xefed	1		
Network-LSA (Area 0.0.0.0)							
Link State ID	ADV Router	Age	Seq#	CkSum			
0.0.0.202	0.0.1.2	1764	0x800000c2	0x94c3			
0.0.0.203	0.0.1.3	1010	0x800000c4	0x8ac8			
Intra-Area-Prefix-LSA (Area 0.0.0.0)							
Link State ID	ADV Router	Age	Seq#	CkSum	Prefix	Reference	
0.0.0.2	0.0.1.2	978	0x800000a1	0x699a	1	Router-LSA	
0.0.0.4	0.0.1.2	1764	0x800000c2	0xca4d	1	Network-LSA	
0.0.0.1	0.0.1.3	1004	0x80000012	0xae2	1	Router-LSA	
0.0.0.7	0.0.1.3	1005	0x8000000e	0x3c89	1	Network-LSA	
AS-external-LSA							
Link State ID	ADV Router	Age	Seq#	CkSum			
0.0.0.13	0.0.1.1	1071	0x8000000e	0xca9f	E2		
0.0.0.14	0.0.1.1	1071	0x8000000e	0xcc9b	E2		
0.0.0.15	0.0.1.1	1071	0x8000000e	0xce97	E2		
0.0.0.16	0.0.1.1	1071	0x8000000e	0xd093	E2		
0.0.0.17	0.0.1.1	1071	0x8000000e	0xd28f	E2		
0.0.0.18	0.0.1.1	1071	0x8000000e	0xd48b	E2		

show ipv6 ospf database external

Overview Use this command in User Exec or Privileged Exec modes to display information about the external LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 ospf database external <adv-router-id> [self-originate|adv-router <adv-router-id>]`

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
self-originate	Self-originated link states.
adv-router	Displays all the LSAs of the specified router.

Mode User Exec and Privileged Exec

Examples To display information about the external LSAs, use the following command:

```
awplus# show ipv6 ospf database external adv-router 10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database external command

```
LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xCE9D
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2010:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1
...
```


show ipv6 ospf database grace

Overview Use this command in User Exec or Privileged Exec modes to display information about the grace LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf database grace <adv-router-id> [self-originate] adv-router <adv-router-id>]

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
adv-router	Displays all the LSAs of the specified router.
self-originate	Self-originated link states.

Mode User Exec and Privileged Exec

Examples To display information about the grace LSAs, use the following command:

```
awplus# show ipv6 ospf database grace adv-router 10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database grace command

```
LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xCE9D
Length: 52
Metric Type: 2 (Larger than any link state path)
Metric: 20
Prefix: 2010:2222::/64
Prefix Options: 0 (-|-|-)
Forwarding Address: 2003:1111::1
```

show ipv6 ospf database inter-prefix

Overview Use this command in User Exec or Privileged Exec modes to display information about the inter-prefix LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf database inter-prefix <adv-router-id> [self-originate|adv-router <adv-router-id>]

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
adv-router	Displays all the LSAs of the specified router.
self-originate	Self-originated link states.

Mode User Exec and Privileged Exec

Examples To display information about the inter-prefix LSAs, use the following command:

```
awplus# show ipv6 ospf database external adv-router 10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database inter-prefix command

```
LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xCE9D
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2010:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1
...
```

show ipv6 ospf database inter-router

Overview Use this command in User Exec or Privileged Exec modes to display information about the inter-router LSAs.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ipv6 ospf database inter-router <adv-router-id> [self-originate| adv-router <adv-router-id>]`

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
adv-router	Displays all the LSAs of the specified router.
self-originate	Self-originated link states.

Mode User Exec and Privileged Exec

Examples To display information about the inter-router LSAs, use the following command:

```
awplus# show ipv6 ospf database inter-router adv-router  
10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database inter-router command

```
LS age: 1087  
LS Type: AS-External-LSA  
Link State ID: 0.0.0.13  
Advertising Router: 0.0.1.1  
LS Seq Number: 0x8000000C  
Checksum: 0xCE9D  
Length: 52  
Metric Type: 2 (Larger than any link state path)  
Metric: 20  
Prefix: 2010:2222::/64  
Prefix Options: 0 (-|-|-)  
Forwarding Address: 2003:1111::1  
...
```

show ipv6 ospf database intra-prefix

Overview Use this command in User Exec or Privileged Exec modes to display information about the intra-prefix LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf database intra-prefix <adv-router-id> [self-originate|adv-router <adv-router-id>]

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
adv-router	Displays all the LSAs of the specified router.
self-originate	Self-originated link states.

Mode User Exec and Privileged Exec

Examples To display information about the intra-prefix LSAs, use the following command:

```
awplus# show ipv6 ospf database intra-prefix adv-router  
10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database intra-prefix command

```
LS age: 1087  
LS Type: AS-External-LSA  
Link State ID: 0.0.0.13  
Advertising Router: 0.0.1.1  
LS Seq Number: 0x8000000C  
Checksum: 0xCE9D  
Length: 52  
Metric Type: 2 (Larger than any link state path)  
Metric: 20  
Prefix: 2010:2222::/64  
Prefix Options: 0 (-|-|-|-)  
Forwarding Address: 2003:1111::1  
...
```

show ipv6 ospf database link

Overview Use this command in User Exec or Privileged Exec modes to display information about the link LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf database link <adv-router-id> [self-originate] adv-router <adv-router-id>]

Parameter	Description
<adv-router-id>	The Advertising Router ID (usually entered in IPv4 address format A.B.C.D). Note that this ID component no longer represents an address; it is simply a character string that has an IPv4 address format.
adv-router	Displays all the LSAs of the specified router.
self-originate	Self-originated link states.

Mode User Exec and Privileged Exec

Examples To display information about the link LSAs, use the following command:

```
awplus# show ipv6 ospf database link adv-router 10.10.10.1
```

Output The following shows typical output.

Example output from the show ipv6 ospf database link command

```
LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xCE9D
Length: 52
Metric Type: 2 (Larger than any link state path)
Metric: 20
Prefix: 2010:2222::/64
Prefix Options: 0 (-|-|-|-)
Forwarding Address: 2003:1111::1
...
```

show ipv6 ospf database network

Overview Use this command in User Exec or Privileged Exec modes to display information about the network LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 ospf database network <adv-router-id> [self-originate] adv-router <adv-router-id>]`

Parameter	Description
<adv-router-id>	The router ID of the advertising router, in IPv4 address format. Note, however, that this no longer represents a real address.
self-originate	Self-originated link states.
adv-router	The advertising router selected.

Mode User Exec and Privileged Exec

Examples To display information about the OSPFv3 network LSAs, use the following command:

```
awplus# show ipv6 ospf database network
```

Output The following shows typical output.

Example output from the show ipv6 ospf database network command

```
OSPFv3 Router with ID (0.0.1.1) (Process P10)
```

```
Network-LSA (Area 0.0.0.0)
```

```
LS age: 97
LS Type: Network-LSA
Link State ID: 0.0.0.202
Advertising Router: 0.0.1.2
LS Seq Number: 0x800000C3
Checksum: 0x92C4
Length: 32
Options: 0x000013 (-|R|-|-|E|V6)
  Attached Router: 0.0.1.2
  Attached Router: 0.0.1.1
```

```
LS age: 1144
LS Type: Network-LSA
Link State ID: 0.0.0.203
Advertising Router: 0.0.1.3
LS Seq Number: 0x800000C4
Checksum: 0x8AC8
Length: 32
Options: 0x000013 (-|R|-|-|E|V6)
  Attached Router: 0.0.1.3
  Attached Router: 0.0.1.1
```

show ipv6 ospf database router

Overview Use this command in User Exec or Privileged Exec modes to display information only about the router LSAs.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 ospf database router <adv-router-id> [self-originate] adv-router <adv-router-id>]`

Parameter	Description
<adv-router-id>	The router ID of the advertising router, in IPv4 address format. Note, however, that this no longer represents a real address.
self-originate	Self-originated link states.
adv-router	The advertising router selected.

Mode User Exec and Privileged Exec

Examples To display information about the OSPFv3 router LSAs, use the following command:

```
awplus# show ipv6 ospf database router
```


Output The following shows typical output.

Example output from the show ipv6 ospf database router command

```
OSPFv3 Router with ID (0.0.1.3) (Process P10)

Router-LSA (Area 0.0.0.0)

LS age: 556
LS Type: Router-LSA
Link State ID: 0.0.0.0
Advertising Router: 0.0.1.1
LS Seq Number: 0x800000CA
Checksum: 0xAA23
Length: 56
Flags: 0x02 (-|-|E|-)
Options: 0x000013 (-|R|-|-|E|V6)

    Link connected to: a Transit Network
        Metric: 1
        Interface ID: 203
        Neighbor Interface ID: 203
        Neighbor Router ID: 0.0.1.3

    Link connected to: a Transit Network
        Metric: 1
        Interface ID: 202
        Neighbor Interface ID: 202
        Neighbor Router ID: 0.0.1.2

LS age: 520
LS Type: Router-LSA
Link State ID: 0.0.0.0
Advertising Router: 0.0.1.2
LS Seq Number: 0x800000D5
Checksum: 0xB328
Length: 40
Flags: 0x00 (-|-|-|-)
Options: 0x000013 (-|R|-|-|E|V6)

    Link connected to: a Transit Network
        Metric: 1
        Interface ID: 202
        Neighbor Interface ID: 202
        Neighbor Router ID: 0.0.1.2

LS age: 543
LS Type: Router-LSA
Link State ID: 0.0.0.0
Advertising Router: 0.0.1.3
LS Seq Number: 0x800000CC
Checksum: 0xF5EA
Length: 40
Flags: 0x00 (-|-|-|-)
Options: 0x000013 (-|R|-|-|E|V6)

    Link connected to: a Transit Network
        Metric: 1
        Interface ID: 203
        Neighbor Interface ID: 203
        Neighbor Router ID: 0.0.1.3
OSPFv3 Router with ID (0.0.1.3) (Process P10)

AS-external-LSA

LS age: 1384
LS Type: AS-External-LSA
```

```
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x80000009
Checksum: 0xD49A
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2010:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1

LS age: 1384
LS Type: AS-External-LSA
Link State ID: 0.0.0.14
Advertising Router: 0.0.1.1
LS Seq Number: 0x80000009
Checksum: 0xD696
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2011:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1

LS age: 1384
LS Type: AS-External-LSA
Link State ID: 0.0.0.15
Advertising Router: 0.0.1.1
LS Seq Number: 0x80000009
Checksum: 0xD892
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2012:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.13
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xCE9D
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2010:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.14
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xD099
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
  Prefix: 2011:2222::/64
  Prefix Options: 0 (-|-|-)
  Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.15
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xD295
Length: 52
  Metric Type: 2 (Larger than any link state path)
  Metric: 20
```

```
Prefix: 2012:2222::/64
Prefix Options: 0 (-|-|-|-)
Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.16
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xD491
Length: 52
Metric Type: 2 (Larger than any link state path)
Metric: 20
Prefix: 2013:2222::/64
Prefix Options: 0 (-|-|-|-)
Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.17
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xD68D
Length: 52
Metric Type: 2 (Larger than any link state path)
Metric: 20
Prefix: 2014:2222::/64
Prefix Options: 0 (-|-|-|-)
Forwarding Address: 2003:1111::1

LS age: 1087
LS Type: AS-External-LSA
Link State ID: 0.0.0.18
Advertising Router: 0.0.1.1
LS Seq Number: 0x8000000C
Checksum: 0xD889
Length: 52
Metric Type: 2 (Larger than any link state path)
Metric: 20
Prefix: 2015:2222::/64
Prefix Options: 0 (-|-|-|-)
Forwarding Address: 2003:1111::1
```

show ipv6 ospf interface

Overview Use this command in User Exec or Privileged Exec modes to display interface information for OSPF for all interfaces or a specified interface, including OSPFv3 Authentication status for all interfaces or for a specified interface.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf interface [<interface-name>]

Parameter	Description
<interface-name>	An alphanumeric string that is the interface name. Omit the optional interface to display information for all interfaces.

Mode User Exec and Privileged Exec

Examples awplus# show ipv6 ospf interface

Output The following shows typical output.

Example output from the show ipv6 ospf interface command showing OSPFv3 Authentication configuration information highlighted in bold

```
awplus#show ipv6 ospf interface
vlan2 is up, line protocol is up
Interface ID 302
IPv6 Prefixes
  fe80::215:77ff:fead:f87e/64 (Link-Local Address)
Security Policy
MD5 Authentication SPI 1000
NULL Encryption SHA-1 Auth, SPI 1001

OSPFv3 Process (10), Area 0.0.0.0, Instance ID 0
Router ID 192.168.1.2, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State Backup, Priority 1
Interface state Backup
Designated Router (ID) 192.168.1.1
Interface Address fe80::21d:e5ff:fec9:cfbe
Backup Designated Router (ID) 192.168.1.2
Interface Address fe80::215:77ff:fead:f87e
Timer interval configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:07
Neighbor Count is 1, Adjacent neighbor count is 1
```

Related [ipv6 ospf authentication spi](#)
commands [ipv6 ospf encryption spi esp](#)

show ipv6 ospf neighbor

Overview Use this command in User Exec or Privileged Exec modes to display information on OSPF neighbors. Include the process ID parameter with this command to display information about specified processes.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf [*<process-id>*] neighbor *<neighbor-id>*
show ipv6 ospf [*<process-id>*] neighbor detail
show ipv6 ospf [*<process-id>*] neighbor *<interface>* [detail]

Parameter	Description
<i><process-id></i>	<i><character string></i> The ID of the OSPF process for which information will be displayed.
<i><neighbor-id></i>	The Neighbor ID, entered in IP address (A.B.C.D) format.
detail	Detail of all neighbors.
<i><interface></i>	IP address of the interface.

Mode User Exec and Privileged Exec

Examples awplus# show ipv6 ospf neighbor

Output The following shows typical output.

Example output from show ipv6 ospf neighbor

```
awplus#show ipv6 ospf P1 neighbor 2.2.2.2
OSPFv3 Process (P1)
Neighbor ID      Pri      State           Dead Time   Interface Instance ID
2.2.2.2          5        2-Way/DROther   00:00:33    vlan3         0
```

Example output from show ipv6 ospf neighbor detail

```
awplus#show ipv6 ospf neighbor detail
Neighbor 0.0.1.2, interface address fe80::215:77ff:fec9:7472
  In the area 0.0.0.0 via interface vlan2
  Neighbor priority is 1, State is Full, 6 state changes
  DR is 0.0.1.2      BDR is 0.0.1.1
  Options is 0x000013 (-|R|-|-|E|V6)
  Dead timer due in 00:00:33
  Database Summary List 0
  Link State Request List 0
  Link State Retransmission List 0
```

show ipv6 ospf route

Overview Use this command in User Exec or Privileged Exec modes to display the OSPF routing table. Include the process ID parameter with this command to display the OSPF routing table for specified processes.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ipv6 ospf [*<process-id>*] route

Parameter	Description
<i><process-id></i>	A character string that specifies the router process. If this parameter is included, only the information for this specified routing process is displayed.

Mode User Exec and Privileged Exec

Examples To display the whole OSPF routing table, use the command:

```
awplus# show ipv6 ospf route
```

Output The following shows typical output.

Example output from the show ipv6 ospf P1 route command for a specific process

```
OSPFv3 Process (P1)
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area
E1 - OSPF external type 1, E2 - OSPF external type 2

Destination Metric
Next-hop
O  2002:1111::/64  2
via fe80::200:cdff:fe24:daae, vlan3, Area 0.0.0.0
C  2003:1111::/64  1
directly connected, vlan3, Area 0.0.0.0
O  2004:1111::/64  3
via fe80::200:cdff:fe24:daae, vlan3, Area 0.0.0.0
C  2005:1111::/64  1
directly connected, vlan5, Area 0.0.0.0
E2 2010:2222::/64  1/20
via 2003:1111::1, vlan3
...
```


show ipv6 ospf virtual-links

Overview Use this command in User Exec or Privileged Exec modes to display virtual link information, including OSPFv3 Authentication status for virtual links.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 ospf virtual-links

Mode User Exec and Privileged Exec

Usage notes See the **[OSPFv3 Feature Overview and Configuration Guide](#)** for more information and examples.

Examples To display virtual link information, use the command:

```
awplus# show ipv6 ospf virtual-links
```

Output The following shows typical output.

Example output from the show ipv6 ospf virtual-links command showing OSPFv3 Authentication configuration information highlighted in bold

```
awplus#show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 192.168.1.10 is down
Transit area 0.0.0.1 via interface *, instance ID 0
Local address
Remote address
MD5 Authentication SPI 1000
NULL encryption SHA-1 auth SPI 1001
Transmit Delay is 1 sec, State Down,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in inactive
Adjacency state Down
```

Related commands **[area virtual-link authentication ipsec spi](#)**
[area virtual-link encryption ipsec spi](#)

summary-address (IPv6 OSPF)

Overview Use this command in Router Configuration mode to summarize, or possibly suppress, external redistributed OSPFv3 routes within the specified address range.

Use the **no** variant of this command in Router Configuration mode to stop summarizing, or suppressing, external redistributed OSPFv3 routes within the specified address range.

Syntax `summary-address <ipv6-addr/prefix-length> [not-advertise] [tag <0-4294967295>]`
`no summary-address <ipv6-addr/prefix-length> [not-advertise] [tag <0-4294967295>]`

Parameter	Description
<code><ipv6-addr/prefix-length></code>	Specifies the base IPv6 address of the IPv6 summary address. The range of addresses given as IPv6 starting address and an IPv6 prefix length.
<code>not-advertise</code>	Set the not-advertise option if you do not want OSPFv3 to advertise either the summary address or the individual networks within the range of the summary address.
<code>tag <0-4294967295></code>	The tag parameter specifies the tag value that OSPFv3 places in the AS external LSAs created as a result of redistributing the summary route. The tag overrides tags set by the original route.

Default The default tag value for a summary address is 0.

Mode Router Configuration

Usage An address range is a pairing of an address and a prefix length. Redistributing routes from other protocols into OSPFv3 requires the router to advertise each route individually in an external LSA. Use this command to advertise one summary route for all redistributed routes covered by a specified prefix to decrease the size of the OSPFv3 link state database.

For example, if the specified address range is 2001:0db8:44::/48, then summary-address functionality will match 2001:0db8:4400:0000::1/128 through 2001:0db8:44ff:ffff::1/128.

Ensure OSPFv3 routes exist in the summary address range for advertisement before using this command.

Example The following example uses the summary-address command to aggregate external LSAs that match the IPv6 prefix 2001:0db8::/32 and assigns a tag value of 3.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# summary-address 2001:0db8::/32 tag 3
```

The following example uses the no summary-address command to stop summarizing IPv6 addresses in the address range covered within the IPv6 prefix 2001:0db8::/32.

```
awplus# configure terminal
awplus(config)# router ipv6 ospf
awplus(config-router)# no summary-address 2001:0db8::/32
```

timers spf exp (IPv6 OSPF)

Overview Use this command to adjust route calculation timers using exponential back-off delays.

Use **no** form of this command to return to the default exponential back-off timer values.

Syntax `timers spf exp <min-holdtime> <max-holdtime>`
`no timers spf exp <min-holdtime> <max-holdtime>`

Parameter	Description
<code><min-holdtime></code>	Specifies the minimum delay between receiving a change to the SPF calculation in milliseconds. The range is 0-2147483647. The default SPF min-holdtime value is 50 milliseconds.
<code><max-holdtime></code>	Specifies the maximum delay between receiving a change to the SPF calculation in milliseconds. The range is 0-2147483647. The default SPF max-holdtime value is 50 seconds.

Mode Router Configuration

Usage notes This command configures the minimum and maximum delay time between the receipt of a topology change and the calculation of the Shortest Path First (SPF).

The time between SPF runs increases if a topology change occurs (and triggers a new SPF run) before the last SPF holdtimer has finished. The time between runs may increase up to the max-holdtime value. This increase in holdtime prevents too many SPF runs from occurring if multiple OSPF topology change events occur.

Examples To set the minimum delay time to 5 milliseconds and maximum delay time to 2 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 ospf 100
awplus(config-router)# timers spf exp 5 2000
```

Related commands [show ipv6 ospf](#)

undebbug ipv6 ospf events

Overview This command applies the functionality of the no **debug ipv6 ospf events**.

undebbug ipv6 ospf ifsm

Overview This command applies the functionality of the no **debug ipv6 ospf ifsm**.

undebbug ipv6 ospf lsa

Overview This command applies the functionality of the no **debug ipv6 ospf lsa**.

undebbug ipv6 ospf nfsm

Overview This command applies the functionality of the no **debug ipv6 ospf nfsm**.

undebbug ipv6 ospf packet

Overview This command applies the functionality of the no **debug ipv6 ospf packet**.

undebbug ipv6 ospf route

Overview This command applies the functionality of the no **debug ipv6 ospf route**.

28

Route Map Commands

- Contents**
- **Introduction** on page 1384
 - **match interface** on page 1385
 - **match ip address** on page 1387
 - **match ip next-hop** on page 1389
 - **match ipv6 address** on page 1391
 - **match metric** on page 1393
 - **match route-type** on page 1394
 - **match tag** on page 1396
 - **route-map** on page 1397
 - **set ip next-hop (route map)** on page 1399
 - **set metric** on page 1400
 - **set metric-type** on page 1402
 - **set tag** on page 1403
 - **show route-map** on page 1404

Introduction

Overview This chapter provides an alphabetical reference for route map commands. For more information, see the [Routemaps Feature Overview and Configuration Guide](#). These commands can be divided into the following categories:

- the **route-map** command, which is used to create a route map and/or route map entry, and to put you into route map mode
- **match** commands, used to determine which routes the route map applies to
- **set** commands, used to modify matching routes

match interface

Overview Use this command to add an interface match clause to a route map entry. Specify the interface name to match.

A route matches the route map if its interface matches the interface name.

Each entry of a route map can only match against one interface in one interface match clause. If the route map entry already has an interface match clause, entering this command replaces that match clause with the new clause.

Use the **no** variant of this command to remove the interface match clause from the route map entry. Use the **no** variant of this command without a specified interface to remove all interfaces.

Syntax match interface <interface>
no match interface [<interface>]

Parameter	Description
<interface>	The interface to match.

Mode Route-map Configuration

Usage This command is valid for RIP and OSPF routes only.

Example To add entry 10 to the route map called 'mymap1', which will process routes if they use the interface vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# route-map mymap1 permit 10
awplus(config-route-map)# match interface vlan1
```

To remove all interfaces from the route map called 'mymap1', use the commands:

```
awplus# configure terminal
awplus(config)# route-map mymap1 permit 10
awplus(config-route-map)# no match interface
```

Related commands

- match ip address**
- match ip next-hop**
- match route-type**
- match tag**
- route-map**
- show route-map**

match ip address

Overview Use this command to add an IP address prefix match clause to a route map entry. You can specify the prefix or prefixes to match by either:

- specifying the name of an access list. To create the access list, enter Global Configuration mode and use the **access-list** command.
- specifying the name of a prefix list. To create the prefix list, enter Global Configuration mode and use the **ip prefix-list** command.

A route matches the route map entry if the route's prefix matches the access list or prefix list.

Use the **no** variant of this command to remove the IP address match clause from a route map entry. To remove a prefix list-based match clause you must also specify the **prefix-list** parameter.

Syntax `match ip address <access-list-id>`
`match ip address prefix-list <prefix-listname>`
`no match ip address`
`no match ip address <access-list-id>`
`no match ip address prefix-list <prefix-listname>`

Parameter	Description
<code><access-list-id></code>	Use an ACL to specify which prefixes to match.
	<code><access-list-name></code> The IP access list name.
	<code><1-199></code> The IP access list number.
	<code><1300-2699></code> The IP access list number (expanded range).
<code>prefix-list</code>	Use an IP prefix list to specify which prefixes to match.
	<code><prefix-listname></code> The prefix list name.

Mode Route-map Configuration

Usage notes Each entry of a route map can have at most one access list-based IP address match clause and one prefix list-based IP address match clause. If the route map entry already has one of these match clauses, entering this command replaces that match clause with the new clause.

Note that access lists, prefix lists and route map entries all specify an action of deny or permit. The action in the access list or prefix list determines whether the route map checks routes for a given prefix. The action in the route map, and the map's **set** clauses, determine what the device does with routes that contain that prefix.

If the **match ip address** command results in a match against the specified IP address, then the outcome is:

- If **permit** is specified, then the route is redistributed or controlled, as specified by the set action.
- If **deny** is specified, then the route is not redistributed or controlled.

If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of **permit** or **deny** specifications.

This command is valid for:

- OSPF routes
- RIP routes.

Examples To add entry 3 to the route map called 'myroute', which will process routes that match the ACL called 'List1', use the commands:

```
awplus# configure terminal
awplus(config)# route-map myroute permit 3
awplus(config-route-map)# match ip address List1
```

To add entry 3 to the route map called 'rmap1', which will process routes that match the prefix list called 'mylist', use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# match ip address prefix-list mylist
```

Related commands

- [access-list \(extended numbered\)](#)
- [access-list \(standard numbered\)](#)
- [ip prefix-list](#)
- [route-map](#)
- [show ip access-list](#)
- [show route-map](#)

match ip next-hop

Overview Use this command to add a next-hop match clause to a route map entry. You can specify the next hop to match by either:

- specifying the name of an access list. To create the access list, enter Global Configuration mode and use the **access-list** command.
- specifying the name of a prefix list. To create the prefix list, enter Global Configuration mode and use the **ip prefix-list** command.

A route matches the route map if the route's next hop matches the access list or prefix list.

Each entry of a route map can have at most one access list-based next-hop match clause and one prefix list-based next-hop match clause. If the route map entry already has one of these match clauses, entering this command replaces that match clause with the new clause.

Note that access lists, prefix lists and route map entries all specify an action of deny or permit. The action in the access list or prefix list determines whether the route map checks routes for a given next-hop value. The route map action and its **set** clauses determine what the route map does with routes that contain that next hop.

Use the **no** variant of this command to remove the next-hop match clause from a route map entry. To remove a prefix list-based match clause you must also specify the prefix-list parameter.

Syntax match ip next-hop *<access-list-id>*
match ip next-hop prefix-list *<prefix-listname>*
no match ip next-hop [*<access-list-id>*]
no match ip next-hop prefix-list [*<prefix-listname>*]

Parameter	Description
<i><access-list-id></i>	Use an ACL to specify which next hops to match.
	<i><access-list-name></i> The IP access list name.
	<i><1-199></i> The IP access list number.
	<i><1300-2699></i> The IP access list number (expanded range).
prefix-list	Use an IP prefix list to specify which next hops to match.
	<i><prefix-listname></i> The prefix list name.

Mode Route-map Configuration

Usage notes This command is valid for:

- OSPF routes
- RIP routes.

Examples To add entry 3 to the route map called 'rmap1', which will process routes whose next hop matches the ACL called 'mylist', use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# match ip next-hop mylist
```

To add entry 3 to the route map called 'mymap', which will process routes whose next hop matches the prefix list called 'list1', use the commands:

```
awplus# configure terminal
awplus(config)# route-map mymap permit 3
awplus(config-route-map)# match ip next-hop prefix-list list1
```

Related commands [access-list \(extended numbered\)](#)
[access-list \(standard numbered\)](#)

[ip prefix-list](#)

[route-map](#)

[show ip access-list](#)

[show ip prefix-list](#)

[show route-map](#)

match ipv6 address

- Overview** Use this command to add an IPv6 address prefix match clause to a route map entry. You can specify the prefix or prefixes to match by either:
- specifying the name of an access list. To create the access list, enter Global Configuration mode and use the **access-list** command.
 - specifying the name of a prefix list. To create the prefix list, enter Global Configuration mode and use the **ipv6 prefix-list** command.

A route matches the route map entry if the route's prefix matches the access list or prefix list.

Use the **no** variant of this command to remove the IPv6 address match clause from a route map entry.

Syntax match ipv6 address *<access-list-id>*
match ipv6 address prefix-list *<prefix-listname>*
no match ipv6 address
no match ipv6 address *<access-list-id>*
no match ipv6 address prefix-list *<prefix-listname>*

Parameter	Description
<i><access-list-id></i>	{ <i><access-list-name></i>|<i><1-199></i>|<i><1300-2699></i> } The IP access list name or number.
<i><access-list-name></i>	The IP access list name.
<i><1-199></i>	The IP access list number.
<i><1300-2699></i>	The IP access list number (expanded range).
prefix-list	Use an IP prefix list to specify which prefixes to match.
<i><prefix-listname></i>	The prefix list name.

Mode Route-map Configuration

Usage notes Each entry of a route map can have at most one access list-based IPv6 address match clause and one prefix list-based IPv6 address match clause. If the route map entry already has one of these match clauses, entering this command replaces that match clause with the new clause.

Note that access lists, prefix lists and route map entries all specify an action of deny or permit. The action in the access list or prefix list determines whether the route map checks routes for a given prefix. The action in the route map, and the map's **set** clauses, determine what the device does with routes that contain that prefix.

If the **match ipv6 address** command results in a match against the specified IPv6 address, then the outcome is:

- If **permit** is specified, then the route is redistributed or controlled, as specified by the set action.
- If **deny** is specified, then the route is not redistributed or controlled.

If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of **permit** or **deny** specifications.

This command is valid for:

- OSPF routes
- RIP routes.

Examples To avoid processing the routes specified by the ACL named "acl1", use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 deny 1
awplus(config-route-map)# match ipv6 address acl1
```

To match traffic according to the prefix list named "mylist", use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# match ipv6 address prefix-list mylist
```

match metric

Overview Use this command to add a metric match clause to a route map entry. Specify the metric value to match.

A route matches the route map if its metric matches the route map's metric.

Each entry of a route map can only match against one metric value in one metric match clause. If the route map entry already has a metric match clause, entering this command replaces that match clause with the new clause.

Use the **no** variant of this command to remove the metric match clause from the route map entry.

Syntax `match metric <metric>`
`no match metric [<metric>]`

Parameter	Description
<metric>	<0-4294967295> Specifies the metric value.

Mode Route-map Configuration

Usage notes This command is valid for:

- OSPF routes
- RIP routes.

Example To stop entry 3 of the route map called "myroute" from processing routes with a metric of 888999, use the commands:

```
awplus# configure terminal
awplus(config)# route-map myroute permit 3
awplus(config-route-map)# no match metric 888999
```

Related commands [route-map](#)
[set metric](#)
[show route-map](#)

match route-type

Overview Use this command to add an external route-type match clause to a route map entry. Specify whether to match OSPF type-1 external routes or OSPF type-2 external routes.

An OSPF route matches the route map if its route type matches the route map's route type.

Each entry of a route map can only match against one route type in one match clause. If the route map entry already has a route type match clause, entering this command replaces that match clause with the new clause.

Use the **no** variant of this command to remove the route type match clause from the route map entry.

Syntax `match route-type external {type-1|type-2}`
`no match route-type external [type-1|type-2]`

Parameter	Description
type-1	OSPF type-1 external routes.
type-2	OSPF type-2 external routes.

Mode Route-map Configuration

Usage Use the **match route-type external** command to match specific external route types. AS- external LSA is either Type-1 or Type-2. **external type-1** matches only Type 1 external routes, and **external type-2** matches only Type 2 external routes.

This command is valid for OSPF routes only.

Example To add entry 10 to the route map called mymap1, which will process type-1 external routes, use the commands:

```
awplus# configure terminal
awplus(config)# route-map mymap1 permit 10
awplus(config-route-map)# match route-type external type-1
```

Related commands

- match interface**
- match ip address**
- match ip next-hop**
- match tag**
- route-map**
- set metric-type**
- show route-map**

match tag

Overview Use this command to add a tag match clause to a route map entry. Specify the route tag value to match.

An OSPF route matches the route map if it has been tagged with the route map's tag value. Routes can be tagged through OSPF commands or through another route map's set clause.

Each entry of a route map can only match against one tag in one match clause. If the route map entry already has a tag match clause, entering this command replaces that match clause with the new clause.

Use the **no** variant of this command to remove the tag match clause from the route map entry.

Syntax match tag <0-4294967295>
no match tag [<0-4294967295>]

Mode Route-map Configuration

Usage This command is valid for OSPF routes only.

Example To add entry 10 to the route map called mymap1, which will process routes that are tagged 100, use the following commands:

```
awplus# configure terminal
awplus(config)# route-map mymap1 permit 10
awplus(config-route-map)# match tag 100
```

Related commands

- [match interface](#)
- [match ip address](#)
- [match ip next-hop](#)
- [match route-type](#)
- [route-map](#)
- [set tag](#)
- [show route-map](#)

route-map

Overview Use this command to configure a route map entry, and to specify whether the device will process or discard matching routes.

The device uses a name to identify the route map, and a sequence number to identify each entry in the route map.

The **route-map** command puts you into route-map configuration mode. In this mode, you can use the following:

- one or more of the **match** commands to create match clauses. These specify what routes match the entry.
- one or more of the **set** commands to create set clauses. These change the attributes of matching routes.

Use the **no** variant of this command to delete a route map or to delete an entry from a route map.

Syntax route-map <mapname> {deny|permit} <seq>
no route-map <mapname>
no route-map <mapname> {deny|permit} <seq>

Parameter	Description
<mapname>	A name to identify the route map.
deny	The route map causes a routing process to discard matching routes.
permit	The route map causes a routing process to use matching routes.
<seq>	<1 - 65535> The sequence number of the entry. You can use this parameter to control the order of entries in this route map.

Mode Global Configuration

Usage notes Route maps allow you to control and modify routing information by filtering routes and setting route attributes. You can apply route maps when the device:

- redistributes routes from one routing protocol into another
- redistributes static routes into routing protocols

When a routing protocol passes a route through a route map, it checks the entries in order of their sequence numbers, starting with the lowest numbered entry.

If it finds a match on a route map with an action of permit, then it applies any set clauses and accepts the route. Having found a match, the route is not compared against any further entries of the route map.

If it finds a match on a route map with an action of deny, it will discard the matching route.

If it does not find a match, it discards the route. This means that route maps end with an implicit deny entry. To permit all non-matching routes, end your route map with an entry that has an action of **permit** and no match clause.

Examples To enter route-map mode for entry 2 of the route map called "route1", and then add a match and set clause to it, use the commands:

```
awplus# configure terminal
awplus(config)# route-map route1 permit 2
awplus(config-route-map)# match interface vlan2
awplus(config-route-map)# set metric 20
```

Note how the prompt changes when you go into route map configuration mode.

To make the device process non-matching routes instead of discarding them, add a command like the following one:

```
awplus(config)# route-map route1 permit 100
```

Related commands

For OSPF:

distribute-list (OSPF)

default-information originate

redistribute (OSPF)

For RIP:

redistribute (RIP)

set ip next-hop (route map)

Overview Use this command to add a next-hop set clause to a route map entry.

When a route matches the route map entry, the device sets the route's next hop to the specified IP address.

Use the **no** variant of this command to remove the set clause.

Syntax `set ip next-hop <ip-address>`
`no set ip next-hop [<ip-address>]`

Parameter	Description
<ip-address>	The IP address of the next hop, entered in the form A.B.C.D.

Mode Route-map Configuration

Usage notes Use this command to set the next-hop IP address to the routes.

This command is valid for:

- OSPF routes
- RIP routes.

Example To use entry 3 of the route map called mymap to give matching routes a next hop of 10.10.0.67, use the commands:

```
awplus# configure terminal
awplus(config)# route-map mymap permit 3
awplus(config-route-map)# set ip next-hop 10.10.0.67
```

Related commands [match ip next-hop](#)
[route-map](#)
[show route-map](#)

set metric

Overview Use this command to add a metric set clause to a route map entry.

When a route matches the route map entry, the device takes one of the following actions:

- changes the metric to the specified value, or
- adds or subtracts the specified value from the metric, if you specify + or - before the value (for example, to increase the metric by 2, enter +2)

Use the **no** variant of this command to remove the set clause.

Syntax `set metric {+<metric-value>|-<metric-value>|<metric-value>}`
`no set metric [+<metric-value>|-<metric-value>|<metric-value>]`

Parameter	Description
+	Increase the metric by the specified amount.
-	Decrease the metric by the specified amount.
<metric-value>	<0-4294967295> The new metric value, or the amount by which to increase or decrease the existing value.

Default The default metric value for routes redistributed into OSPF and OSPFv3 is 20.

Mode Route-map Configuration

Usage notes This command is valid for:

- OSPF routes
- RIP routes.

Note that defining the OSPF metric in a route map supersedes the metric defined using a **redistribute (OSPF)** or a **redistribute (IPv6 OSPF)** command. For more information, see the **OSPFv3 Feature Overview and Configuration Guide** and the **OSPF Feature Overview and Configuration Guide**.

Examples To use entry 3 of the route map called "rmap1" to give matching routes a metric of 600, use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# set metric 600
```

To use entry 3 of the route map called "rmap1" to increase the metric of matching routes by 2, use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# set metric +2
```

Related commands [match metric](#)
[route-map](#)
[show route-map](#)

set metric-type

Overview Use this command to add a metric-type set clause to a route map entry. When a route matches the route map entry, the device sets its route type to the specified value. Use the **no** variant of this command to remove the set clause.

Syntax set metric-type {type-1|type-2}
no set metric-type [type-1|type-2]

Parameter	Description
type-1	Redistribute matching routes into OSPF as type-1 external routes.
type-2	Redistribute matching routes into OSPF as type-2 external routes.

Mode Route-map Configuration

Usage notes This command is valid for OSPF routes only.

Example To use entry 3 of the route map called rmap1 to redistribute matching routes into OSPF as type-1 external routes, use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# set metric-type 1
```

Related commands [default-information originate](#)
[redistribute \(OSPF\)](#)
[match route-type](#)
[route-map](#)
[show route-map](#)

set tag

Overview Use this command to add a tag set clause to a route map entry.

When a route matches the route map entry, the device sets its tag to the specified value when it redistributes the route into OSPF.

Use the **no** variant of this command to remove the set clause.

Syntax set tag <tag-value>
no set tag [<tag-value>]

Parameter	Description
<tag-value>	<0-4294967295> Value to tag matching routes with.

Mode Route-map Configuration

Usage notes This command is valid only when redistributing routes into OSPF.

Example To use entry 3 of the route map called rmap1 to tag matching routes with the number 6, use the commands:

```
awplus# configure terminal
awplus(config)# route-map rmap1 permit 3
awplus(config-route-map)# set tag 6
```

Related commands [default-information originate](#)
[redistribute \(OSPF\)](#)
[match tag](#)
[route-map](#)
[show route-map](#)

show route-map

Overview Use this command to display information about one or all route maps.

Syntax show route-map <map-name>

Parameter	Description
<map-name>	A name to identify the route map.

Mode User Exec and Privileged Exec

Example To display information about the route-map named example-map, use the command:

```
awplus# show route-map example-map
```

Output The following shows typical output.

Example output from the show route-map command

```
route-map example-map, permit, sequence 1
  Match clauses:
    ip address prefix-list example-pref
  Set clauses:
    metric 100
route-map example-map, permit, sequence 200
  Match clauses:
  Set clauses:
```

Related commands [route-map](#)

29 Link Health Monitoring for Switches Commands

- Contents**
- **Introduction** on page 1406
 - **consecutive probe loss** on page 1407
 - **debug linkmon** on page 1409
 - **destination (linkmon-probe)** on page 1411
 - **dscp (linkmon-probe)** on page 1412
 - **egress interface (linkmon-probe)** on page 1413
 - **enable (linkmon-probe)** on page 1414
 - **interval (linkmon-probe)** on page 1415
 - **ip-version (linkmon-probe)** on page 1416
 - **jitter** on page 1417
 - **latency** on page 1419
 - **linkmon probe** on page 1421
 - **linkmon probe-history** on page 1423
 - **linkmon profile** on page 1425
 - **sample-size (linkmon-probe)** on page 1426
 - **service linkmon** on page 1427
 - **show linkmon probe** on page 1428
 - **show linkmon probe-history** on page 1431
 - **show linkmon trigger** on page 1434
 - **size (linkmon-probe)** on page 1437
 - **source (linkmon-probe)** on page 1438
 - **url (linkmon-probe)** on page 1439

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Link Health Monitoring for switches.

For more information, see the [Link Health Monitoring for Switches Feature Overview and Configuration Guide](#).

consecutive probe loss

Overview Use this command within a specific link performance profile to configure the allowable consecutive probe loss thresholds of probes that use that performance profile.

Use the **no** variant of this command to delete a consecutive probe loss threshold.

Syntax consecutive-probe-loss bad-when *<consecutive-probe-losses>*
consecutive-probe-loss good-when *<consecutive-probe-successes>*
consecutive-probe-loss unreachable-when *<consecutive-probe-losses>*
no consecutive-probe-loss bad-when
no consecutive-probe-loss good-when
no consecutive-probe-loss unreachable-when

Parameter	Description
bad-when <i><consecutive-probe-losses></i>	The number of probes that must be lost consecutively, at which point the associated link is considered to be bad, in a range of <1-100>.
good-when <i><consecutive-probe-successes></i>	The number of probes that must succeed consecutively, at which point the associated link is considered to be good, in a range of <1-100>.
unreachable-when <i><consecutive-probe-losses></i>	The number of probes that must be lost consecutively, at which point the associated link is considered to be unreachable, in a range of <1-100>.

Default The performance profile is disabled.

Mode Linkmon Profile Configuration

Usage notes These setting are all optional.

The **bad-when** parameter is used to set the thresholds where if the number of probe replies that have been lost consecutively is equal to or above this value, then that link is considered bad. If **bad-when** is not configured, this metric will never result in a link being considered bad.

The **unreachable-when** parameter is used to set the thresholds where if the number of probe replies that have been lost consecutively is equal to or above this value, then that link is considered unreachable or down. If **unreachable-when** is not configured, this metric will never result in a link being considered unreachable.

The **good-when** parameter is used to state the thresholds where if the number of probe replies that have been successfully received consecutively is equal to or above this value, then that link is considered good. If **good-when** is not configured, then when a link is considered bad or unreachable due to this metric, the first successful probe result will consider the link as good.

Example To configure the point at or above which consecutive probe loss is unacceptable to be 10, the point at or above which consecutive probe success is acceptable to be 5, and the point at or above which consecutive probe loss indicates the destination is unreachable to be 15 for performance profile named "profile0", use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon profile profile0
awplus(config-linkmon-profile)# consecutive-probe-loss bad-when
10
awplus(config-linkmon-profile)# consecutive-probe-loss good-when
5
awplus(config-linkmon-profile)# consecutive-probe-loss
unreachable-when 15
```

To delete consecutive-probe-loss thresholds in performance profile "profile0", use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon profile profile0
awplus(config-linkmon-profile)# no consecutive-probe-loss bad-
when
awplus(config-linkmon-profile)# no consecutive-probe-loss good-
when
awplus(config-linkmon-profile)# no consecutive-probe-loss
unreachable-when
```

Command changes Version 5.4.8-1.1: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

debug linkmon

Overview Use this command to enable Link Health Monitoring debugging.

Use the **no** variant of this command to disable Link Health Monitoring debugging.

Syntax debug linkmon [probe|ip-address|interface|trigger]
no debug linkmon [probe|ip-address|interface|trigger]
debug linkmon probe name <name>
no debug linkmon probe name <name>

Parameter	Description
probe	Link Health Monitoring probe.
ip-address	IP addresses that are of interest to Link Health Monitoring.
interface	Interfaces that are of interest to Link Health Monitoring.
trigger	This debug option will show debugging for Link Health Monitoring triggers.
<name>	The name identifying a Link Health Monitoring probe or Link Health Monitoring group.

Default No debugging is enabled.

Mode Privileged Exec

Usage notes If **probe** is specified, then debug related to all Link Health Monitoring probes is enabled.

If **probe name** <name> is specified, then debug related to the named Link Health Monitoring probe is enabled.

If **ip-address** is specified, then debug related to configuration of IP addresses that are of interest to Link Health Monitoring are enabled. These IP addresses could influence Link Health Monitoring group members being considered up/down.

If **interface** is specified, then debug related to up/down state of Link Health Monitoring is enabled.

If **trigger** is specified, then debug related to Link Health Monitoring triggers is enabled.

Example To enable debugging on the Link Health Monitoring probe 'probe1', use the following command:

```
awplus# debug linkmon probe name probe1
```

To enable debugging on all Link Health Monitoring probes, use the following command:

```
awplus# debug linkmon probe
```

To disable debugging on all Link Health Monitoring probes, use the following command:

```
awplus# no debug linkmon probe
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-0.2: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

destination (linkmon-probe)

Overview Use this command to set the destination of a Link Health Monitoring probe. This is a required configuration option for probes.

Use the **no** variant of this command to remove the destination of a probe.

Syntax destination {<ip-address>|<fqdn>}
no destination

Parameter	Description
<ip-address>	The destination of the probe, an IPv4 or IPv6 IP address.
<fqdn>	The destination of the probe, an FQDN (fully qualified domain name). The IP address of the FQDN will be automatically resolved by the DNS on the device.

Mode Linkmon ICMP Probe Configuration

Example To set the destination of a probe named 'probe1' to 192.168.2.200, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# destination 192.168.2.200
```

To set the destination of a probe named 'probe1' to 2001:db8:a0b:12f0::1, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# destination
2001:db8:a0b:12f0::1
```

To set the destination of a probe named 'probe1' to the FQDN of "google.com", use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# destination google.com
```

To remove the destination of a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# no destination
```

Related commands
Command changes

linkmon probe

Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

dscp (linkmon-probe)

Overview Use this command to set the DSCP value of packets used for Link Health Monitoring probes.

Use the **no** variant of this command to set it back to the default.

Syntax dscp <dscp-value>
no dscp

Parameter	Description
<dscp-value>	The DSCP value for the probe packet in range <0-63>.

Default The default DSCP value is 0.

Mode Linkmon ICMP Probe Configuration

Example To set the DSCP of a probe named 'probe1' to 10, use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# dscp 10
```

To set the DSCP of a probe named 'probe1' back to default, use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# no dscp
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

egress interface (linkmon-probe)

Overview Use this command to force a Link Health Monitoring probe to egress out of a specific interface.

Use the **no** variant of this command to return interface selection back to the default behavior.

Syntax egress interface <interface>

no egress interface

Parameter	Description
<interface>	The name of the egress interface for the probe. The specified egress interface needs to be locally configured and in an up and running state.

Default No egress interface is defined by default. The egress interface will be selected using standard routing behavior to reach the probe's destination.

Mode Linkmon HTTP Probe Configuration, or Linkmon ICMP Probe Configuration

Example To set the egress interface for a probe named 'probe1' to 'vlan2', use the following commands:

```
awplus(config)# linkmon probe name probe1
```

```
awplus(config-linkmon-icmp-probe)# egress interface vlan2
```

To set the egress interface for a probe named 'probe1' back to the default, use the following commands:

```
awplus(config)# linkmon probe name probe1
```

```
awplus(config-linkmon-icmp-probe)# no egress interface
```

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

enable (linkmon-probe)

Overview Use this command to enable individual Link Health Monitoring probes. When a probe is enabled, it will begin transmitting, processing, and storing results.

Use the **no** variant of this command to disable a probe.

Syntax enable
no enable

Default Disabled

Mode Linkmon HTTP Probe Configuration, or Linkmon ICMP Probe Configuration

Example To enable a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# enable
```

To disable a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# no enable
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

interval (linkmon-probe)

Overview Use this command to set the interval between Link Health Monitoring probe packets.

Use the **no** variant of this command to set the interval back to the default.

Syntax `interval <probe-interval>`
`no interval`

Parameter	Description
<code><probe-interval></code>	The gap between probes being transmitted. For ICMP probes, this is a range of 100-10000 milliseconds. For HTTP probes, this is a range of 30000-3600000 milliseconds.

Default For ICMP probes, the default interval is 1000 milliseconds. For HTTP probes, the default interval is 60000 milliseconds.

Mode Linkmon HTTP Probe Configuration, or Linkmon ICMP Probe Configuration

Example To set the interval of a probe named 'probe1' to 100, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# interval 100
```

To set the interval of a probe named 'probe1' back to default, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# no interval
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

ip-version (linkmon-probe)

Overview Use this command to set the IP version for the Link Health Monitoring ICMP probe.

Use the **no** variant of this command to set it back to the default.

Syntax ip-version {4|6}
no ip-version

Parameter	Description
4	Internet Protocol (IPv4)
6	Internet Protocol version 6 (IPv6)

Default IPv4

Mode Linkmon HTTP Probe Configuration, or Linkmon ICMP Probe Configuration

Example To set the IP version as IPv6 for a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1
```

```
awplus(config-linkmon-icmp-probe)# ip-version 6
```

To set the IP version back to the default for a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1
```

```
awplus(config-linkmon-icmp-probe)# no ip-version
```

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

jitter

Overview Use this command to configure the thresholds for the jitter metric. This metric is used to judge whether probes associated with this performance profile are good or bad.

Use the **no** variant of this command to remove jitter bad-above and jitter good-below ranges.

Syntax jitter bad-above <unacceptable-jitter-point>
jitter good-below <acceptable-jitter-point>
no jitter bad-above
no jitter good-below

Parameter	Description
bad-above<unacceptable-jitter-point>	The point above which jitter is unacceptable in range <1-1000> in milliseconds. When a probe associated with this profile has a jitter result greater than this value, the associated Link Health Monitoring member will be considered 'bad'.
good-below<acceptable-jitter-point>	The point at or below which jitter is acceptable in range <1-1000> in milliseconds. When a probe associated with this profile has a jitter result less than this value, the associated Link Health Monitoring member will be considered 'good'.

Mode Linkmon Profile Configuration

Usage notes If only **bad-above** is configured, then if the probe results indicate a link is above this value, then that link is considered bad. As soon as the results fall below this value, the link will be immediately considered good.

The combination of these two parameters allow for hysteresis, which may prevent link-flapping behavior. For example, with a **bad-above** value of 100, and a **good-below** value of 90, if the jitter rises to 100 the link will be marked 'bad', but it will not be marked 'good' until it reaches or falls below 90.

If only **good-below** is configured, then probe results will not cause a link to be considered bad.

Example To configure the point above which jitter is unacceptable to be 100ms and the point at or below which jitter is acceptable to be 90ms for a performance profile named 'profile1', use the following commands:

```
awplus(config)# linkmon profile profile1
awplus(config-linkmon-profile)# jitter bad-above 100
awplus(config-linkmon-profile)# jitter good-below 90
```

To delete the jitter ranges for a performance profile named 'profile1', use the following commands:

```
awplus(config)# linkmon profile profile1
awplus(config-linkmon-profile)# no jitter bad-above
awplus(config-linkmon-profile)# no jitter good-below
```

Related commands [latency](#)
[linkmon probe](#)
[linkmon profile](#)

Command changes Version 5.4.8-0.2: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

latency

Overview Use this command to configure the thresholds for the latency metric. This metric is used to judge whether probes associated with this performance profile are good or bad.

Use the **no** variant of this command to remove latency bad-above and latency good-below ranges.

Syntax latency bad-above *<unacceptable-latency-point>*
latency good-below *<acceptable-latency-point>*
no latency bad-above
no latency good-below

Parameter	Description
bad-above <i><unacceptable-latency-point></i>	The point above which latency is unacceptable in range <i><1-2000></i> in milliseconds. When a probe associated with this profile has a latency result greater than this value, the associated Link Health Monitoring member will be considered 'bad'.
good-below <i><acceptable-latency-point></i>	The point at or below which latency is acceptable in range <i><1-2000></i> in milliseconds. When a probe associated with this profile has a latency result less than this value, the associated Link Health Monitoring member will be considered 'good'.

Mode Linkmon Profile Configuration

Usage notes If only **bad-above** is configured, then if the probe results indicate a link is above this value, then that link is considered bad. As soon as the results fall below this value, the link will be immediately considered good.

The combination of these two parameters allow for hysteresis, which may prevent link-flapping behavior. For example, with a **bad-above** value of 100, and a **good-below** value of 90, if the latency rises to 100 the link will be marked 'bad', but it will not be marked 'good' until it reaches or falls below 90.

If only **good-below** is configured, then probe results will not cause a link to be considered bad.

Example To configure the point above which latency is unacceptable to be 100ms and the point at or below which latency is acceptable to be 90ms for a performance profile named 'profile1', use the following commands:

```
awplus(config)# linkmon profile profile1
awplus(config-linkmon-profile)# latency bad-above 100
awplus(config-linkmon-profile)# latency good-below 90
```

To delete the latency ranges for a performance profile named 'profile1', use the following commands:

```
awplus(config)# linkmon profile profile1
awplus(config-linkmon-profile)# no latency bad-above
awplus(config-linkmon-profile)# no latency good-below
```

Related commands [jitter](#)
[linkmon probe](#)
[linkmon profile](#)

Command changes Version 5.4.8-0.2: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

linkmon probe

Overview Use this command to create a Link Health Monitoring probe and enter the appropriate Link Health Monitoring Probe Configuration Mode where this probe can be configured.

Use the **no** variant of this command to delete the Link Health Monitoring probe.

Syntax linkmon probe name <probe-name> [type {icmp-ping|http-get}]
no linkmon probe name <probe-name>

Parameter	Description
<probe-name>	The name of the probe.
type	The type of the probe. Indicates the packet type or protocol used by the probe, either of icmp-ping (ICMP) or http-get (HTTP). This parameter is optional. If not entered, a newly created probe's type defaults to icmp-ping.

Default The default probe type for a newly created probe is **icmp-ping**. The optional parameter **type** is only required to create a probe type other than the default. The **type** parameter is not required when editing an existing probe or deleting a probe.

Mode Global Configuration

Usage notes The optional probe **type** parameter represents the packet type or protocol used in the transmission of the probe. A probe of type **icmp-ping** will present some different configuration options to a probe of type **http-get**.

An **icmp-ping** Link Health Monitoring probe requires a destination, and must be enabled for probing to begin.

An **http-get** Link Health Monitoring probe requires a URL, and must be enabled for probing to begin.

Example To create a probe named 'probe1' using the default probe type and enter Link Health Monitoring ICMP Probe Configuration Mode to configure it, use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)#
```

To create a probe named 'probe1' using the default ICMP probe type and enter Link Health Monitoring ICMP Probe Configuration Mode to configure it, use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon probe name probe1 type icmp-ping
awplus(config-linkmon-icmp-probe)#
```

To create a probe named 'probe1' using the HTTP probe type and enter Link Health Monitoring HTTP Probe Configuration Mode to configure it, use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon probe name probe1 http-probe
awplus(config-linkmon-http-probe)#
```

To remove a probe named 'probe1', use the following commands:

```
awplus# configure terminal
awplus(config)# no linkmon probe name probe1
```

Related commands

- enable (linkmon-probe)**
- interval (linkmon-probe)**
- jitter**
- latency**
- linkmon probe-history**
- linkmon profile**
- show linkmon probe**
- show linkmon probe-history**
- size (linkmon-probe)**

Command changes

Version 5.4.8-0.2: command added

Version 5.4.8-1.1: now operates as a modal command, with the new type parameter used to determine whether to enter ICMP or HTTP probe mode

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

linkmon probe-history

Overview Use this command to create a collection instance that records the metrics gathered by a Link Health Monitoring probe.

Use the **no** variant of this command to remove the specified collection instance.

Syntax linkmon probe-history [<1-65535>] probe <probe-name> interval <1-2678400> buckets <1-65535>
no linkmon probe-history <1-65535>

Parameter	Description
probe-history <1-65535>	The ID of the probe history collection instance. If this is not set on creation then it will be automatically allocated.
probe <probe-name>	The name of the probe to record metrics for.
interval <1-2678400>	The interval that metrics are collated, in seconds.
buckets <1-65535>	The maximum number of metric history samples.

Mode Global Configuration

Usage notes Metrics are collated every **interval** seconds. Up to **buckets** samples of metrics are collated.

Different **interval** and **buckets** values can be used to record specific kinds of histories. For example, an **interval** value of 1 and a **buckets** value of 3600 would record per second metrics of a probe for an hour. An **interval** value of 3600 and a **buckets** value of 744 would record per hour metrics of a probe for 31 days.

Using the Web API, metric values for a sample are returned as a sum and a count. The sum can be divided by the count for an average. For example, if 10 probes have been sent during a history interval, then the metric counts would be 10 for a sample, and the sum would be the total of the metric values.

If a probe receives no reply then no metric is recorded.

Packet loss is not recorded exactly. Instead the probes sent and probe replies received is recorded.



CAUTION: *This configuration option can consume a large amount of RAM on the device, particularly if you configure high numbers of buckets. The memory is reserved when the command is entered, so if the memory consumption from this command is too high, entering the command will trigger the device's low memory management procedure. The device will continue to operate when it reaches a low memory state, but if available memory decreases further into a critical zone, a warning message will be printed and the device will reboot.*

Example To create a Link Health Monitoring probe history collection instance with an ID of 10 for a probe named 'probe1' that collates metrics every second while keeping up to 300 samples, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# linkmon probe-history 10 probe probe1 interval 1  
buckets 300
```

To create a Link Health Monitoring probe history collection instance with an automatically allocated ID for a probe named 'probe1' that collates metrics every 60 seconds while keeping up to 3600 samples, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# linkmon probe-history probe probe1 interval 60  
buckets 3600
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-0.2: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

linkmon profile

Overview Use this command to create a Link Health Monitoring performance profile and enter Linkmon Profile Configuration mode where this profile can be configured.

Use the **no** variant of this command to remove a configured performance profile.

Syntax linkmon profile *<profile-name>*
no linkmon profile *<profile-name>*

Parameter	Description
<i><profile-name></i>	The name of the performance profile.

Mode Global Configuration

Example To create a new performance profile named 'profile1', use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon profile profile1
awplus(config-linkmon-profile)#
```

To remove a performance profile named 'profile1', use the following commands:

```
awplus# configure terminal
awplus(config)# no linkmon profile profile1
```

Related commands [jitter](#)
[latency](#)
[linkmon probe](#)
[show linkmon probe](#)

Command changes Version 5.4.8-0.2: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

sample-size (linkmon-probe)

Overview Use this command to set the sample size used for calculating latency and jitter metrics for a Link Health Monitoring probe.

Use the **no** variant of this command to set the sample size back to the default value.

Syntax sample-size <1-100>
no sample-size

Parameter	Description
<1-100>	The number of probe samples to use when calculating the latency and jitter metrics.

Default The default sample size is 5.

Mode Linkmon ICMP Probe Configuration

Example To set the sample size a probe named 'probe1' to 10, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# sample-size 10
```

To set the sample size a probe named 'probe1' back to the default, use the following commands:

```
awplus(config)# linkmon probe name probe1
awplus(config-linkmon-icmp-probe)# no sample-size
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

service linkmon

Overview Use this command to enable the Link Health Monitoring service. This is required before any other link health monitoring configuration can be entered.

Use the **no** variant of this command to disable the Link Health Monitoring service.

Syntax service linkmon
no service linkmon

Default The Link Health Monitoring service is disabled.

Mode Global Configuration

Example To enable the Link Health Monitoring service, use the commands:

```
awplus# configure terminal  
awplus(config)# service linkmon
```

To disable the Link Health Monitoring service, use the commands:

```
awplus# configure terminal  
awplus(config)# no service linkmon
```

Related commands

[linkmon probe](#)

Command changes Version 5.5.1-0.1: command added

show linkmon probe

Overview Use this command to display output for one or all link monitoring probes.

Syntax show linkmon probe [*<probe-name>*]

Parameter	Description
<i><probe-name></i>	The name of the specific probe to display.

Mode User Exec and Privileged Exec

Example To show the output for all link monitoring probes, use the following command:

```
awplus# show linkmon probe
```

To show the output for a link monitoring probe named 'probe1', use the following command:

```
awplus# show linkmon probe probe1
```


Output The following shows typical output.

Example output from show linkmon probe

```
awplus#show linkmon probe
Probe Name      : my_probe_1
Status          : enabled
Type            : ICMP
IP version      : IPv4
Destination     : 198.51.100.1
Egress Int      : -
Source          : -
DSCP            : -
Packet Size     : -
Interval        : -
Sample Size     : -

Latest Metrics
Latency         : 1001ms
Jitter          : 0ms
Packet Loss     : 0.0%
Probe Details
Probes Sent     : 3154
Last Probe Sent : 23 Mar 2018 03:36:00
Last Probe Received : 23 Mar 2018 03:36:00

Probe Name      : my_probe_2
Status          : enabled
Type            : ICMP

IP version      : IPv4
Destination     : 203.0.113.1
Egress Int      : -
Source          : -
DSCP            : -
Packet Size     : -
Interval        : -
Sample Size     : -

Latest Metrics
Latency         : 1000ms
Jitter          : 0ms
Packet Loss     : 0.0%
Probe Details
Probes Sent     : 3154
Last Probe Sent : 23 Mar 2018 03:36:00
Last Probe Received : 23 Mar 2018 03:36:00
```

Parameters in the output from show linkmon probe

Parameter	Description
Name	The name of the probe.
Status	Whether the probe is enabled or disabled. If it is enabled, then the device will attempt to send probes if the link is up. If it is disabled, then no probes will be sent.
Type	The type of probe packet sent.
IP version	The IP version being used, IPv4 or IPv6.

Parameter	Description
Destination	The destination IP address that the probes are sent to.
Egress Interface	The interface that the probe packets should egress.
Source	The source IP address or interface.
DSCP	The DSCP value to use when sending the packet.
Packet Size	The size of a probe packet.
Interval	The number of milliseconds between sending out each probe.
Sample Size	The number of probe results to use when calculating the latency and jitter metrics.
Latency	The average latency based on the last sample size samples.
Jitter	The average jitter based on the last sample size samples.
Packet Loss	The percentage of packets lost based on the last 100 probes.
Probes Sent	The number of probe packets that have been sent.
Last Probe Sent	The time that the last probe packet was sent.
Last Probe Received	The time that the device last successfully received a probe packet.

Related commands [linkmon probe](#)

Command changes Version 5.4.8-0.2: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

show linkmon probe-history

Overview Use this command to show information about Link Health Monitoring probe metric history collection instances.

Syntax show linkmon probe-history [<1-65535>|probe <probe-name>]

Parameter	Description
<1-65535>	The ID of the collection instance to show history for.
<probe-name>	The name of the probe to show history for.

Mode User Exec and Privileged Exec

Example To show all Link Health Monitoring probe history collection instances, use the following command:

```
awplus# show linkmon probe-history
```

To show a Link Health Monitoring probe history collection instance with the ID of '10', use the following command:

```
awplus# show linkmon probe-history 10
```

To show all Link Health Monitoring probe history collection instances that are using a probe named 'probe1', use the following command:

```
awplus# show linkmon probe-history probe probe1
```

Output The following shows typical output.

Example output from show linkmon probe-history

```
awplus#show linkmon probe-history
```

ID	Interval (s)	Buckets	Latency (ms): Min	Max	Avg
Probe			Jitter (ms): Min	Max	Avg
			Packets: Tx	Rx	Loss (%)
10	1	300/300	94	105	99
PROBE1			2	11	6
			2978	2978	0.00
20	5	300/300	97	102	99
PROBE1			4	9	6
			14892	14892	0.00
30	10	300/300	98	101	100
PROBE1			5	8	6
			29785	29785	0.00

Parameters in the output from show linkmon probe-history

Parameter	Description
ID	The ID of the Link Health Monitoring probe-history.
Probe	The name of the probe that this history is for.
Interval	The amount of time between each history sample (in seconds).
Buckets	The total number of samples that are stored.
Latency min	The minimum latency that is in the history.
Latency max	The maximum latency that is in the history.
Latency avg	The average latency of the samples stored in the history.
Jitter min	The minimum jitter that is in the history.
Jitter max	The maximum jitter that is in the history.
Jitter avg	The average jitter of the samples stored in the history.
Packets Tx	The total number of packets transmitted in this history.
Packets Rx	The total number of packets received in this history.
Packets Loss	The percentage of packets lost in the history.

Related commands [linkmon probe](#)
[linkmon probe-history](#)

Command Version 5.4.8-0.2: command added
changes Version 5.5.1-0.1: command added to all AlliedWare Plus switches

show linkmon trigger

Overview Use this command to view the status of link health monitoring probe type triggers.

Syntax show linkmon trigger [<1-250>]

Parameter	Description
<1-250>	The trigger ID for a link health monitoring trigger.

Mode Privileged Exec

Example To view the status of all link health monitoring triggers, use the command:

```
awplus# show linkmon trigger
```

To view the status of link health monitoring trigger 1, use the command:

```
awplus# show linkmon trigger 1
```

Output The following shows typical output.

Example output from show linkmon trigger

```
awplus#show linkmon trigger
Trigger 1
-----
Match State:          bad
Change Count:         5
Last Change:
  Current State:      good
  Previous State:     unknown
  Change Time:        09 Feb 2021 21:41:15
  Cause:              Rx probe 'my_probe', consecutive probe
  success (3>=3)

Probe:                my_probe
Enabled:              Yes
Latest Metrics
  Latency              : 1ms
  Jitter               : 1ms
  Loss Rate             : 22.6%
  Consecutive Success  : 7

Profile:              my_profile
  latency bad above    : - ms
  latency good below   : - ms
  jitter bad above     : - ms
  jitter good below    : - ms
  Consecutive success good when : 3
  Consecutive loss bad when   : 2
  Consecutive loss unreachable when : 4
```

Parameters in the output from show linkmon trigger

Parameter	Description
Match State	If the state of the probe is the same as the match state, the trigger will activate.
Change Count	The number of times the probe has changed state.
Current State	The current state of the probe.
Previous State	The previous state of the probe.
Change Time	The timestamp when the probe last changed state.
Cause	The reason why the probe last changed state.
Probe	The name of the probe.
Enabled	Whether the probe is enabled.
Latency	The last latency metric of the probe.
Jitter	The last jitter metric of the probe.
Loss Rate	The loss rate of the probe, up to 100 metric results calculated.

Parameter	Description
Consecutive Success	The number of probes that have consecutively succeeded.
Profile	The name of the profile the probe results are being compared to. The profile determines the acceptable jitter, latency, and probe loss.

Related commands [show linkmon probe](#)

Command changes Version 5.5.1-0.1: command added

size (linkmon-probe)

Overview Use this command to set the size of the packets used by a Link Health Monitoring probe.

Use the **no** variant of this command to set the size back to the default.

Syntax size <64-1500>
no size

Parameter	Description
<64-1500>	The size of the probe packet in bytes.

Default The default packet size is 100 bytes.

Mode Linkmon ICMP Probe Configuration

Example To set the size of a probe named 'probe1' to 1000, use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# size 1000
```

To set the size of a probe named 'probe1' back to the default, use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# no size
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

source (linkmon-probe)

Overview Use this command to set the source IP address or interface for a Link Health Monitoring probe.

Use the **no** variant of this command to return it to the default.

Syntax source {<interface>|<ip-address>}
no source

Parameter	Description
<interface>	The name of the interface that probes are sourcing from. The specified interface needs to be locally configured with at least one valid IPv4 address, and the interface is in up and running state.
<ip-address>	The source IPv4 address for this probe. The specified IP address needs to be locally configured on an interface that is in an up-and-running state.

Default No source IP address is defined by default. The source IP address will be selected using standard routing behavior to reach the probe's destination.

Mode Linkmon ICMP Probe Configuration

Example To set the source interface as 'lo' for a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# source lo
```

To set the source interface back to default for a probe named 'probe1', use the following commands:

```
awplus(config)# linkmon probe name probe1  
awplus(config-linkmon-icmp-probe)# no source
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added

Version 5.5.1-0.1: command added to all AlliedWare Plus switches

url (linkmon-probe)

Overview Use this command to set the destination URL of a Link Health Monitoring probe. This is a required configuration option for http-get probes.

Use the **no** variant of this command to remove the URL.

Syntax url <url>
no url

Parameter	Description
<url>	The destination the probe is being sent to. The URL must use ASCII characters and conform to the URL syntax in RFC 3986, with http or https protocol at the start and an optional port number on the end, such as :80, :443 or :8080.

Mode Linkmon HTTP Probe Configuration

Example To set the destination URL of a Link Health Monitoring probe named "test-probe", use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon probe name test-probe type http
awplus(config-linkmon-http-probe)# url http://
www.alliedtelesis.co.nz/
```

Some other examples of supported URL formats:

```
awplus(config-linkmon-http-probe)# url https://www.facebook.com/
awplus(config-linkmon-http-probe)# url http://
intranet.atlnz.lc:8080
```

To remove the URL, use the following commands:

```
awplus# configure terminal
awplus(config)# linkmon probe name test-probe type http
awplus(config-linkmon-http-probe)# no url
```

Related commands [linkmon probe](#)

Command changes Version 5.4.8-1.1: command added
Version 5.5.1-0.1: command added to all AlliedWare Plus switches

Part 4: Multicast Applications

30

IGMP and IGMP Snooping Commands

- Contents**
- **Introduction** on page 1443
 - **clear ip igmp** on page 1444
 - **clear ip igmp group** on page 1445
 - **clear ip igmp interface** on page 1446
 - **debug igmp** on page 1447
 - **ip igmp** on page 1448
 - **ip igmp access-group** on page 1449
 - **ip igmp flood-group** on page 1450
 - **ip igmp flood specific-query** on page 1452
 - **ip igmp immediate-leave** on page 1453
 - **ip igmp last-member-query-count** on page 1454
 - **ip igmp last-member-query-interval** on page 1455
 - **ip igmp limit** on page 1456
 - **ip igmp maximum-groups** on page 1458
 - **ip igmp mroute-proxy** on page 1460
 - **ip igmp proxy-service** on page 1461
 - **ip igmp querier-timeout** on page 1463
 - **ip igmp query-holdtime** on page 1464
 - **ip igmp query-interval** on page 1466
 - **ip igmp query-max-response-time** on page 1468
 - **ip igmp ra-option** on page 1470
 - **ip igmp robustness-variable** on page 1471
 - **ip igmp snooping** on page 1472
 - **ip igmp snooping fast-leave** on page 1473
 - **ip igmp snooping mrouter** on page 1474
 - **ip igmp snooping querier** on page 1475
 - **ip igmp snooping report-suppression** on page 1476
 - **ip igmp snooping routermode** on page 1477
 - **ip igmp snooping source-timeout** on page 1479
 - **ip igmp snooping tcn query solicit** on page 1480
 - **ip igmp source-address-check** on page 1483
 - **ip igmp ssm** on page 1484
 - **ip igmp ssm-map enable** on page 1485
 - **ip igmp ssm-map static** on page 1486
 - **ip igmp static-group** on page 1488
 - **ip igmp startup-query-count** on page 1490
 - **ip igmp startup-query-interval** on page 1491

- **ip igmp trusted** on page 1492
- **ip igmp version** on page 1493
- **show debugging igmp** on page 1494
- **show ip igmp groups** on page 1495
- **show ip igmp interface** on page 1497
- **show ip igmp proxy** on page 1499
- **show ip igmp proxy groups** on page 1500
- **show ip igmp snooping mrouter** on page 1502
- **show ip igmp snooping routermode** on page 1503
- **show ip igmp snooping source-timeout** on page 1504
- **show ip igmp snooping statistics** on page 1505
- **undebg igmp** on page 1507

Introduction

Overview Devices running AlliedWare Plus use IGMP (Internet Group Management Protocol) and MLD (Multicast Listener Discovery) to track which multicast groups their clients belong to. This enables them to send the correct multimedia streams to the correct destinations. IGMP is used for IPv4 multicasting, and MLD is used for IPv6 multicasting.

This chapter describes the commands to configure IGMP Querier behaviour and selection, IGMP Snooping and IGMP Proxy.

clear ip igmp

Overview Use this command to clear all IGMP group membership records on all interfaces where it is configured .

Syntax clear ip igmp

Mode Privileged Exec

Example To delete all IGMP records, use the command
awplus# clear ip igmp

Related commands [clear ip igmp group](#)
[clear ip igmp interface](#)
[show ip igmp interface](#)
[show running-config](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

clear ip igmp group

Overview Use this command to clear IGMP group membership records for a specific group on either all interfaces, a single interface, or for a range of interfaces.

Syntax clear ip igmp group *
clear ip igmp group <ip-address> <interface>

Parameter	Description
*	Clears all groups on all interfaces. This has the same effect as the clear ip igmp command.
<ip-address>	Specifies the group whose membership records will be cleared from all interfaces, entered in the form A.B.C.D.
<interface>	Specifies the name of the interface; all groups learned on this interface are deleted.

Mode Privileged Exec

Usage notes This command applies to groups learned by IGMP, IGMP Snooping, or IGMP Proxy.

In addition to the group, an interface can be specified. Specifying this will mean that only entries with the group learned on the interface will be deleted.

Examples To delete all group records, use the command:

```
awplus# clear ip igmp group *
```

To delete records for 224.1.1.1 on vlan1, use the command:

```
awplus# clear ip igmp group 224.1.1.1 vlan1
```

Related commands [clear ip igmp](#)
[clear ip igmp interface](#)
[show ip igmp interface](#)
[show running-config](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

clear ip igmp interface

Overview Use this command to clear IGMP group membership records on a particular interface.

Syntax clear ip igmp interface *<interface>*

Parameter	Description
<i><interface></i>	Specifies the name of the interface. All groups learned on this interface are deleted.

Mode Privileged Exec

Usage notes This command applies to interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example To delete records for vlan1, use the command:

```
awplus# clear ip igmp interface vlan1
```

Related commands

- [clear ip igmp](#)
- [clear ip igmp group](#)
- [show ip igmp interface](#)
- [show running-config](#)

Command changes

- Version 5.4.7-1.1: VRF-lite support added SBx8100.
- Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

debug igmp

Overview Use this command to enable debugging of either all IGMP or a specific component of IGMP.

Use the **no** variant of this command to disable all IGMP debugging, or debugging of a specific component of IGMP.

Syntax `debug igmp {all|decode|encode|events|fsm|tib}`
`no debug igmp {all|decode|encode|events|fsm|tib}`

Parameter	Description
all	Enable or disable all debug options for IGMP
decode	Debug of IGMP packets that have been received
encode	Debug of IGMP packets that have been sent
events	Debug IGMP events
fsm	Debug IGMP Finite State Machine (FSM)
tib	Debug IGMP Tree Information Base (TIB)

Modes Privileged Exec and Global Configuration

Example `awplus# configure terminal`
`awplus(config)# debug igmp all`

Related commands [show debugging igmp](#)
[undebug igmp](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip igmp

Overview Use this command to enable IGMP on an interface. The command configures the device as an IGMP querier.

Use the **no** variant of this command to return all IGMP related configuration to the default on this interface.

Syntax `ip igmp`
`no ip igmp`

Default Disabled

Mode Interface Configuration for a VLAN interface.

Usage notes An IP address must be assigned to the interface first, before this command will work.

Example To specify an interface as an IGMP querier, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp access-group

Overview This command adds an access control list to a VLAN interface configured for IGMP, IGMP Snooping, or IGMP Proxy. The access control list is used to control and filter the multicast groups learned on the VLAN interface.

The **no** variant of this command disables the access control filtering on the interface.

Syntax `ip igmp access-group {<access-list-number>|<access-list-name>}`
`no ip igmp access-group`

Parameter	Description
<code><access-list-number></code>	Standard IP access-list number, in the range <1-99>.
<code><access-list-name></code>	Standard IP access-list name.

Default By default there are no access lists configured on any interface.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example In the following example, hosts serviced by VLAN interface vlan2 can only join the group 225.2.2.2:

```
awplus# configure terminal
awplus(config)# access-list 1 permit 225.2.2.2 0.0.0.0
awplus(config)# interface vlan2
awplus(config-if)# ip igmp access-group 1
```

ip igmp flood-group

Overview Use this command to configure a static multicast group that will flood matching packets to all ports in the VLAN and not mirror any packets matching that group to the CPU.

Use the **no** variant of this command to remove an IGMP flooding group.

Syntax `ip igmp flood-group <ip-address> [<vlan-id>]`
`no ip igmp flood-group <ip-address>`

Parameter	Description
<code><ip-address></code>	Standard IP Multicast group address, entered in the form A.B.C.D.
<code><vlan-id></code>	Layer 3 downstream interface list for Layer 3 forwarding of multicast packets.

Default Not set.

Mode Interface Configuration

Usage notes Multicast packets from an unregistered source will be mirrored to the CPU to ensure IGMP and PIM-SM knows about the group. In certain networks, it is possible for a large number of packets with a number of different sources destined for the same group address, to overwhelm a switches hardware table. This could cause packets to be stuck mirrored to the CPU forever, resulting in high CPU usage and in some cases stack failovers.

This command adds an all sources multicast entry into the switches multicast hardware table, to flood multicast packets to all ports within the VLAN without mirroring the traffic to CPU. This significantly reduces the number of hardware entries consumed.

The Layer 3 variant of this command:

`ip igmp flood-group <ip-address> <vlan-id>`

is only supported on one VLAN group address. Any number of the Layer 2 variants can be used.

Example To configure an IGMP flooding group to Layer 2 ports only, use the following commands. This will flood any UDP packet to group 239.255.255.250 to all ports in vlan1:

```
awplus# configure terminal
awplus(config)# int vlan1
awplus(config-if)# ip igmp flood-group 239.255.255.250
```

To configure an IGMP flooding group to Layer 2 ports and Layer 3 forwarding, use the following commands. This will flood any UDP packet to group 239.255.255.250 to all ports in vlan2 and forward any UDP packet to all ports in vlan3:

```
awplus# configure terminal
awplus(config)# int vlan2
awplus(config-if)# ip igmp flood-group 239.255.255.250 vlan3
```

To remove an IGMP flooding group from vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# int vlan2
awplus(config-if)# no ip igmp flood-group 239.255.255.250
```

IGMP Flooding Groups are integrated into the existing command: **show ip igmp groups**

Output The following shows typical output.

Example output from show ip igmp groups

```
awplus#show ip igmp groups
IGMP Connected Group Membership
Group Address      Interface    Uptime      Expires      Last Reporter
239.255.255.250    vlan3000    01:20:59    stopped      0.0.0.0
```

Related commands **ip igmp static-group**

Command changes Version 5.5.0-2.3: command added

ip igmp flood specific-query

Overview Use this command if you want IGMP to flood specific queries to all VLAN member ports, instead of only sending the queries to multicast group member ports.

Use the **no** variant of this command if you want IGMP to only send the queries to multicast group member ports.

Syntax ip igmp flood specific-query
no ip igmp flood specific-query

Default By default, specific queries are flooded to all VLAN member ports.

Mode Global Configuration

Usage In an L2 switched network running IGMP, it is considered more robust to flood all specific queries. In most cases, the benefit of flooding specific queries to all VLAN member ports outweighs the disadvantages.

However, sometimes this is not the case. For example, if hosts with very low CPU capability receive specific queries for multicast groups they are not members of, their performance may degrade unacceptably. In this situation, it is desirable for IGMP to send specific queries to known member ports only. This minimizes the performance degradation of such hosts. In those circumstances, use this command to turn off flooding of specific queries.

Example To cause IGMP to flood specific queries only to multicast group member ports, use the commands:

```
awplus# configure terminal
awplus(config)# no ip igmp flood specific-query
```

Related commands [show ip igmp interface](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip igmp immediate-leave

Overview In IGMP version 2, use this command to minimize the leave latency of IGMP memberships for specified multicast groups. The specified access list number or name defines the multicast groups in which the immediate leave feature is enabled.

Use the **no** variant of this command to disable this feature.

Syntax `ip igmp immediate-leave group-list {<access-list-number>|<access-list-number-expanded>|<access-list-name>}`
`no ip igmp immediate-leave`

Parameter	Description
<code><access-list-number></code>	Access-list number, in the range <1-99>.
<code><access-list-number-expanded></code>	Access-list number (expanded range), in the range <1300-1999>.
<code><access-list-name></code>	Standard IP access-list name.

Default Disabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example The following example shows how to enable the immediate-leave feature on the VLAN interface vlan2 for a specific range of multicast groups:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp immediate-leave group-list 34
awplus(config-if)# exit
awplus(config)# access-list 34 permit 225.192.20.0 0.0.0.255
```

Related commands [ip igmp last-member-query-interval](#)

ip igmp last-member-query-count

Overview Use this command to set the last-member query-count value for an interface.

Use the **no** variant of this command to return to the default on an interface.

Syntax `ip igmp last-member-query-count <2-7>`
`no ip igmp last-member-query-count`

Parameter	Description
<2-7>	Last member query count value.

Default The default last member query count value is 2.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example To set the last-member query-count to 3 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp last-member-query-count 3
```

Related commands [ip igmp last-member-query-interval](#)
[ip igmp startup-query-count](#)
[show ip igmp interface](#)
[show running-config](#)

ip igmp last-member-query-interval

Overview Use this command to configure the frequency at which the router sends IGMP group specific host query messages.

Use the **no** variant of this command to set this frequency to the default.

Syntax ip igmp last-member-query-interval *<interval>*
no ip igmp last-member-query-interval

Parameter	Description
<i><interval></i>	The frequency in milliseconds at which IGMP group-specific host query messages are sent, in the range 1000-25500.

Default 1000 milliseconds

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example To change the IGMP group-specific host query message interval to 2 seconds (2000 milliseconds) on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp last-member-query-interval 2000
```

Related commands [ip igmp immediate-leave](#)
[ip igmp last-member-query-count](#)
[show ip igmp interface](#)
[show running-config](#)

ip igmp limit

Overview Use this command to configure the limit on the maximum number of group membership entries for the device as a whole or for the specified interface (if in interface mode). Once the specified number of group memberships is reached, all further membership reports will be ignored.

Optionally, you can configure an access-list to stop certain addresses from being subject to the limit.

Use the **no** variant of this command to unset the limit and any specified exception access-list.

Syntax `ip igmp limit <limit-value> [except {<access-list-number>|<access-list-number-expanded>|<access-list-name>}]`
`no ip igmp limit`

Parameter	Description
<code><limit-value></code>	Maximum number of group membership entries, from 2 to 512.
<code><access-list-number></code>	Access-list number, in the range 1 to 99.
<code><access-list-number-expanded></code>	Access-list number (expanded range), in the range 1300 to 1999.
<code><access-list-name></code>	IP access-list name.

Default 512

Mode Global Configuration and Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP, IGMP Snooping, or IGMP Proxy.

Example To configure an IGMP limit of 100 group membership entries on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp limit 100
```

To configure an IGMP limit of 100 group membership entries across all interfaces on which IGMP is enabled, and exclude group 224.1.1.1 from this limitation, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 1 permit 224.1.1.1 0.0.0.0
awplus(config)# ip igmp limit 100 except 1
```

ip igmp maximum-groups

Overview Use this command to set a limit, per switch port, on the number of IGMP groups clients can join. This stops a single client from using all the switch's available group-entry resources, and ensures that clients on all ports have a chance to join IGMP groups.

Use the **no** variant of this command to remove the limit.

Syntax `ip igmp maximum-groups <0-65535>`
`no ip igmp maximum-groups`

Parameter	Description
<code><0-65535></code>	The maximum number of IGMP groups clients can join on this switch port. 0 means no limit.

Default The default is 0, which means no limit

Mode Interface mode for a switch port

Usage notes We recommend using this command with IGMP snooping fast leave on the relevant VLANs. To enable fast leave, use the command:

```
awplus(config-if)# ip igmp snooping fast-leave
```

The device keeps count of the number of groups learned by each port. This counter is incremented when group joins are received via IGMP reports. It is decremented when:

- Group memberships time out
- Group leaves are received via leave messages or reports

Also, the port's group counter is cleared when:

- The port goes down
- You run the command **clear ip igmp group ***
- The port is removed from a VLAN

You can see the current value of the group counter by using either of the commands:

```
awplus# show ip igmp snooping statistics interface <port-list>
```

```
awplus# show ip igmp interface <port>
```

Example To limit clients to 10 groups on port 1.0.1, which is in vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# ip igmp maximum-groups 10
awplus(config-if)# exit
awplus(config)# interface vlan1
awplus(config-if)# ip igmp snooping fast-leave
```

Related commands

- clear ip igmp group**
- ip igmp snooping fast-leave**
- show ip igmp interface**
- show ip igmp snooping statistics**

ip igmp mroute-proxy

Overview Use this command to enable IGMP mroute proxy on this downstream interface and associate it with the upstream proxy service interface.

Use the **no** variant of this command to remove the association with the proxy-service interface.

Syntax `ip igmp mroute-proxy <interface>`
`no ip igmp mroute-proxy`

Parameter	Description
<interface>	The name of the interface.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP Proxy.

You must also enable the IGMP proxy service on the upstream interface, using the **ip igmp proxy-service** command. You can associate one or more downstream mroute proxy interfaces on the device with a single upstream proxy service interface. This downstream mroute proxy interface listens for IGMP reports, and forwards them to the upstream IGMP proxy service interface.

IGMP Proxy does not work with other multicast routing protocols, such as PIM-SM or PIM-DM.

Example To configure vlan3 as the upstream proxy-service interface for the downstream vlan2 interface, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast-routing
awplus(config)# interface vlan3
awplus(config-if)# ip igmp proxy-service
awplus(config-if)# ip igmp
awplus(config)# interface vlan2
awplus(config-if)# ip igmp mroute-proxy vlan3
awplus(config-if)# ip igmp
```

Related commands **ip igmp**
ip igmp proxy-service
ip multicast-routing

ip igmp proxy-service

Overview Use this command to enable an interface to be the upstream IGMP proxy-service interface for the device. All associated downstream IGMP mroute proxy interfaces on this device will have their memberships consolidated on this proxy service interface, according to IGMP host-side functionality.

Use the **no** variant of this command to remove the designation of the interface as an upstream proxy-service interface.

Syntax `ip igmp proxy-service`
`no ip igmp proxy-service`

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP Proxy.

This command is used with the **ip igmp mroute-proxy** command to enable forwarding of IGMP reports to a proxy service interface for all forwarding entries for this interface. You must also enable the downstream IGMP mroute proxy interfaces on this device using the command **ip igmp mroute-proxy**.

IGMP Proxy does not work with other multicast routing protocols, such as PIM-SM or PIM-DM.

From version 5.4.7-1.1 onwards, IGMP mroute proxy interfaces do not have to be configured with an IP address before they can operate. Instead, it is possible to have an addressless interface operate as an IGMP mroute proxy interface.

This feature is useful when IGMP Proxy needs to run on many downstream interfaces. For example, you may want to use it if your device has one subscriber (multicast receiver) per VLAN, and many receivers (many VLANs) connected to the device. In such a situation, assigning IP addresses to each VLAN may not be practicable.

Note that for such interface to be able to send queries to hosts directly attached to the interface, it is necessary to enable IGMP snooping querier on the interface, using the command **ip igmp snooping querier**.

Example To configure vlan3 as the upstream proxy-service interface for the downstream vlan2 interface, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast-routing
awplus(config)# interface vlan3
awplus(config-if)# ip igmp proxy-service
awplus(config-if)# ip igmp
awplus(config)# interface vlan2
awplus(config-if)# ip igmp mroute-proxy vlan3
awplus(config-if)# ip igmp
```

Related commands

- ip igmp**
- ip igmp mroute-proxy**
- ip igmp snooping querier**
- ip multicast-routing**

Command changes

- Version 5.4.7-1.1: Addressless interface support added.
- Version 5.4.7-1.1: VRF-lite support added to SBx8100.
- Version 5.4.8-1.1: VRF-lite support added to x930, SBx908 GEN2.

ip igmp querier-timeout

Overview Use this command to configure the timeout period before the device takes over as the querier for the interface after the previous querier has stopped querying.

Use the **no** variant of this command to restore the default.

Syntax `ip igmp querier-timeout <timeout>`
`no ip igmp querier-timeout`

Parameter	Description
<timeout>	IGMP querier timeout interval value in seconds, in the range 1- 65535.

Default The default timeout interval is 255 seconds.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to VLAN interfaces configured for IGMP.
The timeout value should not be less than the current active querier's general query interval.

Example To configure the device to wait 130 seconds from the time it received the last query before it takes over as the querier for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp querier-timeout 130
```

Related commands [ip igmp query-interval](#)
[show ip igmp interface](#)
[show running-config](#)

ip igmp query-holdtime

Overview This command sets the time that an IGMP Querier waits after receiving a query solicitation before it sends an IGMP Query. IGMP General Query messages will not be sent during the hold time interval.

Use the **no** variant of this command to return to the default query hold time period.

Syntax `ip igmp query-holdtime <interval>`
`no ip igmp query-holdtime`

Parameter	Description
<interval>	Query interval value in milliseconds, in the range <100-5000>.

Default By default the delay before sending IGMP General Query messages is 500 milliseconds.

Mode Interface Configuration for a VLAN interface.

Usage notes Use this command to configure a value for the IGMP query hold time in the current network. IGMP Queries can be generated after receiving Query Solicitation (QS) packets and there is a possibility of a DoS (Denial of Service) attack if a stream of Query Solicitation (QS) packets are sent to the IGMP Querier, eliciting a rapid stream of IGMP Queries. This command applies to interfaces on which the device is acting as an IGMP Querier.

Use the **ip igmp query-interval** command when a delay for IGMP general query messages is required and IGMP general query messages are required. The **ip igmp query-holdtime** command stops IGMP query messages during the configured holdtime interval, so the rate of IGMP Queries that can be sent out of an interface can be restricted.

See the **IGMP Feature Overview and Configuration Guide** for introductory information about the Query Solicitation feature.

Examples To set the IGMP query holdtime to 900 ms for vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp query-holdtime 900
```

To reset the IGMP query holdtime to the default (500 ms) for vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip igmp query-holdtime
```

Related commands

- ip igmp query-interval**
- ip igmp snooping tcn query solicit**
- show ip igmp interface**
- show running-config**

ip igmp query-interval

Overview Use this command to configure the period for sending IGMP General Query messages.

The IGMP query interval specifies the time between IGMP General Query messages being sent.

Use the **no** variant of this command to return to the default query interval period.

NOTE: The IGMP query interval must be greater than IGMP query maximum response time.

Syntax `ip igmp query-interval <interval>`
`no ip igmp query-interval`

Parameter	Description
<interval>	Query interval value in seconds, in the range <2-18000>.

Default The default IGMP query interval is 125 seconds.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to interfaces configured for IGMP. Note that the IGMP query interval is automatically set to a greater value than the IGMP query max response time.

For example, if you set the IGMP query max response time to 2 seconds using the **ip igmp query-max-response-time** command, and the IGMP query interval is currently less than 3 seconds, then the IGMP query interval period will be automatically reconfigured to be 3 seconds, so it is greater than the IGMP query maximum response time.

Use the **ip igmp query-interval** command when a non-default interval for IGMP General Query messages is required.

The **ip igmp query-holdtime** command can occasionally delay the sending of IGMP Queries.

Examples To set the period between IGMP host-query messages to 3 minutes (180 seconds) for vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp query-interval 180
```

To reset the period between sending IGMP host-query messages to the default (125 seconds) for vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip igmp query-interval
```

Related commands

- ip igmp query-holdtime**
- ip igmp query-max-response-time**
- ip igmp startup-query-interval**
- show ip igmp interface**
- show running-config**

ip igmp query-max-response-time

Overview Use this command to configure the maximum response time advertised in IGMP Queries.

Use the **no** variant of this command to restore the default.

NOTE: The IGMP query maximum response time must be less than the IGMP query interval.

Syntax ip igmp query-max-response-time <response-time>
no ip igmp query-max-response-time

Parameter	Description
<response-time>	Response time value in seconds, in the range 1-3180.

Default The default IGMP query maximum response time is 10 seconds.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to interfaces configured for IGMP.

Note that the IGMP query interval is automatically set to a greater value than the IGMP query maximum response time.

For example, if you set the IGMP query interval to 3 seconds using the **ip igmp query-interval** command, and the current IGMP query interval is less than 3 seconds, then the IGMP query maximum response time will be automatically reconfigured to be 2 seconds, so it is less than the IGMP query interval time.

To get the network to converge faster, use the **ip igmp query-max-response-time** command and set a low response time value, such as one or two seconds, so that the clients will respond immediately with a report as a response to the IGMP Queries.

Examples To set a maximum response time of 8 seconds for vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp query-max-response-time 8
```

To reset the default maximum response time to the default (10 seconds) for vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip igmp query-max-response-time
```

Related commands

- ip igmp query-interval**
- show ip igmp interface**
- show running-config**

ip igmp ra-option

Overview Use this command to enable strict Router Alert (RA) option validation. With strict RA option enabled, IGMP packets without RA options are ignored.
Use the **no** variant of this command to disable strict RA option validation.

Syntax ip igmp ra-option
no ip igmp ra-option

Default The default state of RA validation is unset.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to interfaces configured for IGMP and IGMP Snooping.

Examples To enable strict Router Alert (RA) option validation on vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp ra-option
```

ip igmp robustness-variable

Overview Use this command to change the robustness variable value on an interface.

Use the **no** variant of this command to return to the default on an interface.

Syntax ip igmp robustness-variable <1-7>
no ip igmp robustness-variable

Parameter	Description
<1-7>	The robustness variable value.

Default The default robustness variable value is 2.

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to interfaces configured for IGMP and IGMP Snooping.

Examples To set the robustness variable to 3 on vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp robustness-variable 3
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp snooping

Overview Use this command to enable IGMP Snooping. When this command is used in the Global Configuration mode, IGMP Snooping is enabled at the device level. When this command is used in Interface Configuration mode, IGMP Snooping is enabled for the specified VLANs.

Use the **no** variant of this command to either globally disable IGMP Snooping, or disable IGMP Snooping on a specified interface.

NOTE: *IGMP snooping cannot be disabled on an interface if IGMP snooping has already been disabled globally. IGMP snooping can be disabled on both an interface and globally if disabled on the interface first and then disabled globally.*

Syntax ip igmp snooping
no ip igmp snooping

Default By default, IGMP Snooping is enabled both globally and on all VLANs.

Mode Global Configuration and Interface Configuration for a VLAN interface.

Usage notes It is possible to disable IGMP snooping globally or on a per-VLAN basis, using the command **no ipv6 igmp snooping**. However, we recommend leaving IGMP snooping enabled unless an Allied Telesis support representative tells you to disable it, even if you are not actively using the device for multicast.

For IGMP snooping to operate on particular VLAN interfaces, it must be enabled both globally by using this command in Global Configuration mode, and on individual VLAN interfaces by using this command in Interface Configuration mode (both are enabled by default).

Examples To enable IGMP Snooping on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ip igmp snooping
awplus(config)# interface vlan2
awplus(config-if)# ip igmp snooping
```

Related commands [ipv6 mld snooping](#)
[show ip igmp interface](#)
[show running-config](#)

ip igmp snooping fast-leave

Overview Use this command to enable IGMP Snooping fast-leave processing. Fast-leave processing is analogous to immediate-leave processing. The IGMP group-membership entry is removed as soon as an IGMP leave group message is received, without sending out a group-specific query.

Use the **no** variant of this command to disable fast-leave processing.

Syntax `ip igmp snooping fast-leave`
`no ip igmp snooping fast-leave`

Default IGMP Snooping fast-leave processing is disabled.

Mode Interface Configuration for a VLAN interface.

Usage notes This IGMP Snooping command can only be configured on VLAN interfaces.

Example To enable fast-leave processing on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp snooping fast-leave
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp snooping mrouter

Overview Use this command to statically configure the specified port as a multicast router port for IGMP Snooping for an interface. This command applies to interfaces configured for IGMP Snooping.

Use the **no** variant of this command to remove the static configuration of the port as a multicast router port.

Syntax `ip igmp snooping mrouter interface <port>`
`no ip igmp snooping mrouter interface <port>`

Parameter	Description
<port>	The port may be a device port (e.g. port1.0.2), a static channel group (e.g. sa3), or a dynamic (LACP) channel group (e.g. po4).

Mode Interface Configuration for a VLAN interface.

Example To configure port1.0.2 statically as a multicast router interface for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp snooping mrouter interface port1.0.2
```

Related commands [show ip igmp snooping mrouter](#)

ip igmp snooping querier

Overview Use this command to enable IGMP querier operation when no multicast routing protocol is configured. When enabled, the IGMP Snooping querier sends out periodic IGMP queries for all interfaces. This command applies to interfaces configured for IGMP Snooping.

Use the **no** variant of this command to disable IGMP querier configuration.

Syntax `ip igmp snooping querier`
`no ip igmp snooping querier`

Mode Interface Configuration for a VLAN interface.

Usage notes The IGMP Snooping querier uses the 0.0.0.0 Source IP address because it only masquerades as a proxy IGMP querier for faster network convergence.

It does not start, or automatically cease, the IGMP Querier operation if it detects query message(s) from a multicast router.

If an IP address is assigned to a VLAN, which has IGMP querier enabled on it, then the IGMP Snooping querier uses the VLAN's IP address as the Source IP Address in IGMP queries.

The IGMP Snooping Querier will not stop sending IGMP Queries if there is another IGMP Snooping Querier in the network with a lower Source IP Address.

NOTE: *Do not enable the IGMP Snooping Querier feature on a Layer 2 device when there is an operational IGMP Querier in the network.*

Example To configure vlan2 as a Snooping querier, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp snooping querier
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp snooping report-suppression

Overview Use this command to enable report suppression for IGMP versions 1 and 2. This command applies to interfaces configured for IGMP Snooping.

Report suppression stops reports being sent to an upstream multicast router port when there are already downstream ports for this group on this interface.

Use the **no** variant of this command to disable report suppression.

Syntax `ip igmp snooping report-suppression`
`no ip igmp snooping report-suppression`

Default Report suppression does not apply to IGMPv3, and is turned on by default for IGMPv1 and IGMPv2 reports.

Mode Interface Configuration for a VLAN interface.

Example To enable report suppression for IGMPv2 reports for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp version 2
awplus(config-if)# ip igmp snooping report-suppression
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp snooping routermode

Overview Use this command to set the destination IP addresses as router multicast addresses.

Use the **no** variant of this command to set it to the default. You can also remove a specified IP address from a custom list of multicast addresses.

Syntax `ip igmp snooping routermode {all|default|ip|multicastrouter|
address <ip-address>}`
`no ip igmp snooping routermode [address <ip-address>]`

Parameter	Description
all	All reserved multicast addresses (224.0.0.x). Packets from all possible addresses in range 224.0.0.x are treated as coming from routers.
default	Default set of reserved multicast addresses. Packets from 224.0.0.1, 224.0.0.2, 224.0.0.4, 224.0.0.5, 224.0.0.6, 224.0.0.9, 224.0.0.13, 224.0.0.15 and 224.0.0.24 are treated as coming from routers.
ip	Custom reserved multicast addresses. Packets from custom IP address in the 224.0.0.x range are treated as coming from routers.
multicastrouter	Packets from DVMRP (224.0.0.4) and PIM (224.0.0.13) multicast addresses are treated as coming from routers.
address <ip-address>	Packets from the specified multicast address are treated as coming from routers. The address must be in the 224.0.0.x range.

Default The default routermode is **default** (not **all**) and shows the following reserved multicast addresses:

Router mode.....Def
Reserved multicast address
224.0.0.1
224.0.0.2
224.0.0.4
224.0.0.5
224.0.0.6
224.0.0.9
224.0.0.13
224.0.0.15
224.0.0.24

Mode Global Configuration

Examples To set **ip igmp snooping routermode** for all default reserved addresses enter:

```
awplus(config)# ip igmp snooping routermode default
```

To remove the multicast address 224.0.0.5 from the custom list of multicast addresses enter:

```
awplus(config)# no ip igmp snooping routermode address 224.0.0.5
```

Related commands **ip igmp trusted**
show ip igmp snooping routermode

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip igmp snooping source-timeout

Overview Use this command to set the global IGMP Snooping source time-out value (in seconds) on the switch.

Use the **no** variant of this command to set the source time-out value to be the same as the group membership timeout.

Syntax `ip igmp snooping source-timeout <timeout>`
`no ip igmp snooping source-timeout <timeout>`

Parameter	Description
<timeout>	Time-out value in seconds <0-86400>

Default Global IGMP Snooping source-timeout is disabled by default, and unregistered multicast will be timed-out like normal entries.

Interface IGMP Snooping source timeout is disabled by default, and unregistered multicast will be timed-out like normal entries.

Mode Interface/Global Configuration

Usage notes The timeout determines how long unregistered multicast entries will be kept for. If the value '0' is specified, then effectively all unregistered multicast entries will never be timed out, and can only be cleared by using the command **clear ip igmp group**. The interface settings will always take precedence over the global setting.

Example To configure IGMP Snooping source timeout on 'vlan1', use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip igmp snooping source-timeout 200
```

Related commands [show ip igmp snooping source-timeout](#)

ip igmp snooping tcn query solicit

Overview Use this command to enable IGMP (Internet Group Management Protocol) Snooping TCN (Topology Change Notification) Query Solicitation feature. When this command is used in the Global Configuration mode, Query Solicitation is enabled.

Use the **no** variant of this command to disable IGMP Snooping TCN Query Solicitation. When the **no** variant of this command is used in Interface Configuration mode, this overrides the Global Configuration mode setting and Query Solicitation is disabled.

Syntax `ip igmp snooping tcn query solicit`
`no ip igmp snooping tcn query solicit`

Default IGMP Snooping TCN Query Solicitation is disabled by default on the device, unless the device is the Master Node in an EPSR ring, or is the Root Bridge in a Spanning Tree.

When the device is the Master Node in an EPSR ring, or the device is the Root Bridge in a Spanning Tree, then IGMP Snooping TCN Query Solicitation is enabled by default and cannot be disabled using the Global Configuration mode command. However, Query Solicitation can be disabled for specified interfaces using the **no** variant of this command from the Interface Configuration mode.

Mode Global Configuration, and Interface Configuration for a VLAN interface.

Usage notes Once enabled, if the device is not an IGMP Querier, on detecting a topology change, the device generates IGMP Query Solicit messages that are sent to all the ports of the vlan configured for IGMP Snooping on the device.

On a device that is not the Master Node in an EPSR ring or the Root Bridge in a Spanning Tree, Query Solicitation can be disabled using the **no** variant of this command after being enabled.

If the device that detects a topology change is an IGMP Querier then the device will generate an IGMP Query message.

Note that the **no** variant of this command when issued in Global Configuration mode has no effect on a device that is the Master Node in an EPSR ring or on a device that is a Root Bridge in a Spanning Tree. Query Solicitation is not disabled for the device these instances. However, Query Solicitation can be disabled on a per-vlan basis from the Interface Configuration mode.

See the following state table that shows when Query Solicit messages are sent in these instances:

Command issued from Global Configuration	Command issued from Interface Configuration	Device is STP Root Bridge or the EPSR Master Node	IGMP Query Solicit message sent on VLAN
No	Yes	Yes	Yes
Yes	No	Yes	No
Yes	Yes	Yes	Yes

See the [IGMP Feature Overview and Configuration Guide](#) for introductory information about the Query Solicitation feature.

Examples To enable Query Solicitation on a device, use the commands:

```
awplus# configure terminal
awplus(config)# ip igmp snooping tcn query solicit
```

To disable Query Solicitation on a device, use the commands:

```
awplus# configure terminal
awplus(config)# no ip igmp snooping tcn query solicit
```

To enable Query Solicitation for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp snooping tcn query solicit
```

To disable Query Solicitation for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip igmp snooping tcn query solicit
```

Related commands **ip igmp query-holdtime**
show ip igmp interface
show running-config

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip igmp source-address-check

Overview This command enables the checking of the Source Address for an IGMP Report, rejecting any IGMP Reports originating on devices outside of the local subnet.

Use the **no** variant of this command to disable the checking of the Source Address for an IGMP Report, which allows IGMP Reports from devices outside of the local subnet.

Syntax ip igmp source-address-check
no ip igmp source-address-check

Default Source address checking for IGMP Reports is enabled by default.

Mode Interface Configuration for a VLAN interface.

Usage notes This is a security feature, and should be enabled unless IGMP Reports from outside the local subnet are expected, for example, if Multicast VLAN Registration is active in the network.

The no variant of this command is required to disable the IGMP Report source address checking feature in networks that use Multicast VLAN Registration to allow IGMP Reports from devices outside of the local subnet.

Examples To deny IGMP Reports from outside the current subnet for vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan20
awplus(config-if)# ip igmp source-address-check
```

To allow IGMP Reports from outside the current subnet for vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip igmp source-address-check
```

Related commands [show ip igmp interface](#)
[show running-config](#)

ip igmp ssm

Overview Use this command to define a non-default Source Specific Multicast (SSM) range of IP multicast addresses in IGMP. Incoming IGMPv1 and IGMPv2 join requests are ignored if the multicast IP address is in the SSM range and no SSM mapping is configured for these addresses. By default, the SSM range is 232/8. To define the SSM range to be other than the default, use one of the access-list parameter options.

Use the **no** variant of this command to change the SSM range in IGMP back to the default.

Syntax `ip igmp ssm range {<access-list-number>|<access-list-name>}`
`no ip igmp ssm`

Parameter	Description
<code><access-list-number></code>	Access-list number, in the range 1 to 99.
<code><access-list-name></code>	Standard IP access-list name.

Default By default the SSM range is 232/8.

Mode Global Configuration

Examples To configure a non-default SSM range to be used in IGMP enter the commands:

```
awplus# configure terminal
awplus(config)# access-list 10 permit 224.1.1.0 0.0.0.255
awplus(config)# ip igmp ssm range 10
```

To return to the default configuration enter the commands:

```
awplus# configure terminal
awplus(config)# no ip igmp ssm
```

Related commands [access-list \(standard numbered\)](#)
[ip pim ssm](#)

ip igmp ssm-map enable

Overview Use this command to enable Source Specific Multicast (SSM) mapping on the device.

Use the **no** variant of this command to disable SSM mapping.

Syntax ip igmp ssm-map enable
no ip igmp ssm-map enable

Mode Global Configuration

Usage notes This command applies to VLAN interfaces configured for IGMP.

Example To enable SSM on the device enter the commands:

```
awplus# configure terminal
awplus(config)# ip igmp ssm-map enable
```

Related commands [ip igmp ssm-map static](#)

ip igmp ssm-map static

Overview Use this command to specify the static mode of defining Source Specific Multicast (SSM) mapping. SSM statically assigns sources to IGMPv1 and IGMPv2 groups to translate such (*,G) groups' memberships to (S,G) memberships for use with PIM-SSM.

Use the **no** variant of this command to remove the SSM map association.

Syntax `ip igmp ssm-map static {<access-list-number>|<access-list-number-extended>|<access-list-name>} <ip-address>`
`no ip igmp ssm-map static {<access-list-number>|<access-list-number-extended>|<access-list-name>} <ip-address>`

Parameter	Description
<code><access-list-number></code>	Access-list number, in the range 1 to 99.
<code><access-list-number-extended></code>	Access-list number (expanded range), in the range 1300 to 1999.
<code><access-list-name></code>	Standard IP access-list name.
<code><ip-address></code>	Source address to use for static map group, entered in the form A.B.C.D.

Mode Global Configuration

Usage notes This command applies to VLAN interfaces configured for IGMP. You can use Standard numbered and Standard named ACLs plus Expanded Numbered ACLs.

Examples This example shows how to configure an SSM static mapping for group-address 224.1.1.1, using a standard numbered ACL shown as 10:

```
awplus# configure terminal
awplus(config)# access-list 10 permit 224.1.1.1 0.0.0.0
awplus(config)# ip igmp ssm-map static 10 1.2.3.4
```

This example shows how to configure an SSM static mapping for group-address 224.1.1.1, using an expanded numbered ACL shown as 1301:

```
awplus# configure terminal
awplus(config)# access-list 1301 permit 224.1.1.1 0.0.0.0
awplus(config)# ip igmp ssm-map static 1301 1.2.3.4
```

This example shows how to configure an SSM static mapping for group-address 224.1.1.1, using a standard named ACL shown as sales:

```
awplus# configure terminal
awplus(config)# access-list sales permit 224.1.1.1 0.0.0.0
awplus(config)# ip igmp ssm-map static sales 1.2.3.4
```

Related commands [ip igmp ssm-map enable](#)

ip igmp static-group

Overview Use this command to statically configure multicast group membership entries on a VLAN interface, or to statically forward a multicast channel out a particular port or port range.

To statically add only a group membership, do not specify any parameters.

To statically add a (*,g) entry to forward a channel out of a port, specify only the multicast group address and the switch port range.

To statically add an (s,g) entry to forward a channel out of a port, specify the multicast group address, the source IP address, and the switch port range.

To use Source Specific Multicast mapping to determine the source IP address of the multicast server use the **ssm-map** parameter instead of specifying the source IP address.

Use the **no** variant of this command to delete static group membership entries.

Syntax `ip igmp static-group <ip-address> [source {<ip-source-addr>|ssm-map}] [interface <port>]`
`no ip igmp static-group <ip-address> [source {<ip-source-addr>|ssm-map}] [interface <port>]`

Parameter	Description
<ip-address>	Standard IP Multicast group address, entered in the form A.B.C.D, to be configured as a static group member.
source	Optional.
<ip-source-addr>	Standard IP source address, entered in the form A.B.C.D, to be configured as a static source from where multicast packets originate.
ssm-map	This parameter uses Source Specific Multicast (SSM) Mapping to determine the source IP address associated with the specified IP Multicast group address. SSM mappings are configured using the ip igmp ssm-map static command.
interface	Use this parameter to specify a specific switch port or switch port range to statically forward the multicast group out of. If not used, static configuration is applied on all ports in the VLAN.
<port>	The port or port range to statically forward the group out of. The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa2), or a dynamic (LACP) channel group (e.g. po2).

Mode Interface Configuration for a VLAN interface.

Usage notes This command applies to IGMP operation, or to IGMP Snooping on a VLAN interface.

Example The following example show how to statically add group and source records for IGMP on vlan3:

```
awplus# configure terminal
awplus(config)# interface vlan3
awplus(config-if)# ip igmp
awplus(config-if)# ip igmp static-group 226.1.2.4 source
10.2.3.4
```

ip igmp startup-query-count

Overview Use this command to configure the IGMP startup query count for an interface. The IGMP startup query count is the number of IGMP General Query messages sent by a querier at startup. The default IGMP startup query count is 2.

Use the **no** variant of this command to return an interface's configured IGMP startup query count to the default.

Syntax `ip igmp startup-query-count <startup-query-count>`
`no ip igmp startup-query-count`

Parameter	Description
<code><startup-query-count></code>	Specify the IGMP startup query count, in the range 2-10.

Default The default IGMP startup query count is 2.

Mode Interface Configuration for a VLAN interface.

Example To set the IGMP startup query count to 4 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp startup-query-count 4
```

Related commands [ip igmp last-member-query-count](#)
[ip igmp startup-query-interval](#)

ip igmp startup-query-interval

Overview Use this command to configure the IGMP startup query interval for an interface. The IGMP startup query interval is the amount of time in seconds between successive IGMP General Query messages sent by a querier during startup. The default IGMP startup query interval is one quarter of the IGMP query interval value.

Use the **no** variant of this command to return an interface's configured IGMP startup query interval to the default.

Syntax `ip igmp startup-query-interval <startup-query-interval>`
`no ip igmp startup-query-interval`

Parameter	Description
<code><startup-query-interval></code>	Specify the IGMP startup query interval, in the range of 2-1800 seconds. The value must be one quarter of the IGMP query interval value.

Default The default IGMP startup query interval is one quarter of the IGMP query interval value.

NOTE: *The IGMP startup query interval must be one quarter of the IGMP query interval.*

Mode Interface Configuration for a VLAN interface.

Example To set the IGMP startup query interval to 15 seconds for vlan2, which is one quarter of the IGMP query interval of 60 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp query-interval 60
awplus(config-if)# ip igmp startup-query-interval 15
```

Related commands [ip igmp last-member-query-interval](#)
[ip igmp query-interval](#)
[ip igmp startup-query-count](#)

ip igmp trusted

Overview Use this command to allow IGMP to process packets received on certain trusted ports only.

Use the **no** variant of this command to stop IGMP from processing specified packets if the packets are received on the specified ports or aggregator.

Syntax `ip igmp trusted {all|query|report|routermode}`
`no ip igmp trusted {all|query|report|routermode}`

Parameter	Description
all	Specifies whether or not the interface is allowed to receive all IGMP and other routermode packets
query	Specifies whether or not the interface is allowed to receive IGMP queries
report	Specifies whether or not the interface is allowed to receive IGMP membership reports
routermode	Specifies whether or not the interface is allowed to receive routermode packets

Default By default, all ports and aggregators are trusted interfaces, so IGMP is allowed to process all IGMP query, report, and router mode packets arriving on all interfaces.

Mode Interface mode for one or more switch ports or aggregators

Usage Because all ports are trusted by default, use this command in its **no** variant to stop IGMP processing packets on ports you do not trust.

For example, you can use this command to make sure that only ports attached to approved IGMP routers are treated as router ports.

Example To stop ports port1.0.3-port1.0.6 from being treated as router ports by IGMP, use the commands:

```
awplus(config)# interface port1.0.3-port1.0.6
awplus(config-if)# no ip igmp trusted routermode
```

Related commands [ip igmp snooping routermode](#)

ip igmp version

Overview Use this command to set the current IGMP version (IGMP version 1, 2 or 3) on an interface.

Use the **no** variant of this command to return to the default version.

Syntax ip igmp version <1-3>
no ip igmp version

Parameter	Description
version <1-3>	IGMP protocol version number

Default The default IGMP version is 3.

Mode Interface Configuration for a VLAN interface.

Example To set the IGMP version to 2 for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip igmp version 2
```

Related commands [show ip igmp interface](#)

show debugging igmp

Overview Use this command to see what debugging is turned on for IGMP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging igmp

Mode User Exec and Privileged Exec

Example To display the IGMP debugging options set, enter the command:
awplus# show debugging igmp

Output The following shows typical output.

Example output from the show debugging igmp command

```
IGMP Debugging status:
IGMP Decoder debugging is on
IGMP Encoder debugging is on
IGMP Events debugging is on
IGMP FSM debugging is on
IGMP Tree-Info-Base (TIB) debugging is on
```

Related commands [debug igmp](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp groups

Overview Use this command to display the multicast groups with receivers directly connected to the router, and learned through IGMP.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip igmp groups [brief]
show ip igmp groups <ip-address> [detail]
show ip igmp groups <interface> [<ip-address>] [detail]

Parameter	Description
<ip-address>	Address of the multicast group, entered in the form A.B.C.D.
<interface>	Interface name for which to display local information.
brief	Brief display of all interfaces.
detail	Detailed display of the interface.

Mode User Exec and Privileged Exec

Example The following command displays local-membership information for all ports in all interfaces:

```
awplus# show ip igmp groups
```

Output The following shows typical output.

Example output from show ip igmp groups

IGMP Connected Group Membership				
Group Address	Interface	Uptime	Expires	Last Reporter
224.0.1.1	port1.0.1	00:00:09	00:04:17	10.10.0.82
224.0.1.24	port1.0.2	00:00:06	00:04:14	10.10.0.84
...				

Parameters in the output of show ip igmp groups

Parameter	Description
Group Address	Address of the multicast group.
Interface	Port through which the group is reachable.
Uptime	The time in weeks, days, hours, minutes, and seconds that this multicast group has been known to the device.
Expires	Time (in hours, minutes, and seconds) until the entry expires.
Last Reporter	Last host to report being a member of the multicast group.

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.
Version 5.4.8-2.3: **brief** parameter added.

show ip igmp interface

Overview Use this command to display the state of IGMP, IGMP Proxy service, and IGMP Snooping for a specified VLAN, or all VLANs. IGMP is shown as Active or Disabled in the show output. You can also display the number of groups a switch port belongs to.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ip igmp interface [<interface>]

Parameter	Description
<interface>	The name of the interface. If you specify a switch port number, the output displays the number of groups the port belongs to, and the port’s group membership limit, if a limit has been set (with the command ip igmp maximum-groups).

Mode User Exec and Privileged Exec

Output The following output shows IGMP interface status for vlan2 with IGMP Snooping enabled:

```
awplus#show ip igmp interface vlan2
Interface vlan2 (Index 202)
  IGMP Disabled, Inactive, Version 3 (default)
  IGMP interface has 0 group-record states
  IGMP activity: 0 joins, 0 leaves
  IGMP robustness variable is 2
  IGMP last member query count is 2
  IGMP query interval is 125 seconds

  IGMP query holdtime is 500 milliseconds
  IGMP querier timeout is 255 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1000 milliseconds
  Group Membership interval is 260 seconds
  Strict IGMPv3 ToS checking is disabled on this interface
  Source Address checking is enabled
  IGMP Snooping is globally enabled
  IGMP Snooping query solicitation is globally disabled
  Num. query-solicit packets: 57 sent, 0 recvd
  IGMP Snooping is enabled on this interface
  IGMP Snooping fast-leave is not enabled
  IGMP Snooping querier is not enabled
  IGMP Snooping report suppression is enabled
```

The following output shows IGMP interface status for vlan2 with IGMP Snooping disabled:

```
awplus#show ip igmp interface vlan2
Interface vlan2 (Index 202)
  IGMP Disabled, Inactive, Version 3 (default)
  IGMP interface has 0 group-record states
  IGMP activity: 0 joins, 0 leaves
  IGMP robustness variable is 2
  IGMP last member query count is 2
  IGMP query interval is 125 seconds

  IGMP query holdtime is 500 milliseconds
  IGMP querier timeout is 255 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1000 milliseconds
  Group Membership interval is 260 seconds
  Strict IGMPv3 ToS checking is disabled on this interface
  Source Address checking is enabled
  IGMP Snooping is globally enabled
  IGMP Snooping query solicitation is globally disabled
  Num. query-solicit packets: 57 sent, 0 recvd
  IGMP Snooping is not enabled on this interface
  IGMP Snooping fast-leave is not enabled
  IGMP Snooping querier is not enabled
  IGMP Snooping report suppression is enabled
```

The following output displays membership information for port1.0.1:

```
awplus#show ip igmp interface port1.0.1
IGMP information for port1.0.1
  Maximum groups limit set: 10
  Number of groups port belongs to: 0
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp proxy

Overview Use this command to display the state of IGMP Proxy services for a specified interface or for all interfaces.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip igmp proxy

Mode User Exec and Privileged Exec

Example To display the state of IGMP Proxy services for all interfaces, enter the command:

```
awplus# show ip igmp proxy
```

Output The following shows typical output.

Example output from show ip igmp proxy

```
awplus#show ip igmp proxy
Interface vlan40 (Index 340)
Administrative status: enabled
Operational status: up
Upstream interface is vlan30
Number of multicast groups: 1
```

Related commands [ip igmp proxy-service](#)

show ip igmp proxy groups

Overview Use this command to display multicast groups with receivers directly connected to the router, learned through IGMP, which use a proxy service. You can also use a filter to specify a multicast group IP address and /or interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip igmp proxy groups [detail]
show ip igmp proxy groups <multicast-group> [detail]
show ip igmp proxy groups <vlan> [detail]
show ip igmp proxy groups <vlan> <multicast-group> [detail]

Parameter	Description
groups	Specify IGMP proxy group membership information.
detail	Specify detailed IGMPv3 source information.
<vlan>	Specify the name of a single VLAN interface, for example vlan1 .
<multicast-group>	Specify the IPv4 address in of the multicast group, in the format A.B.C.D.

Mode User Exec

Example To display local membership information for IGMP proxy service interfaces, use the command:

```
awplus# show ip igmp proxy groups
```

Output The following shows typical output.

Example output from show ip igmp proxy groups

```
awplus#show ip igmp proxy groups
IGMP Connected Proxy Group Membership
Group Address      Interface      Member state
224.9.10.11        vlan10        Delay
```

Example To display local membership information for IGMP proxy service interfaces, use the command:

```
awplus# show ip igmp proxy groups detail
```


Output The following shows typical output.

Example output from show ip igmp proxy groups detail

```
awplus#show ip igmp proxy groups detail
Interface:      vlan10
Group:          224.9.10.11
Group mode:     Exclude
Member state:   Delay
Source list is empty

Summary :
IGMP Connected Proxy Group Membership
Group Address   Interface      Member state
224.9.10.11     vlan10        DelayDetail :
Interface:      vlan10
Group:          224.9.10.11
Group mode:     Exclude
Member state:   Delay
Source list is empty
```

Parameters in the output of show ip igmp proxy groups

Parameter	Description
Interface	The interface that received the IGMP report.
Group	The multicast group address that has been requested by the IGMP report.
Group mode	Include mode indicates that the multicast receiver has sent an IGMPv3 report for a group with a list of addresses that it wants to receive traffic from. Exclude mode indicates that the multicast receiver has sent an IGMPv3 report for a group with a list of addresses that it does not want to receive traffic from.
Member state	Delay indicates that no group or source query timers are running for the specified group, otherwise the member state is shown as Idle .

Related commands [show ip igmp proxy](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp snooping mrrouter

Overview Use this command to display the multicast router ports, both static and dynamic, in a VLAN.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip igmp snooping mrrouter [interface <interface>]

Parameter	Description
interface	A specific interface.
<interface>	The name of the VLAN interface.

Mode User Exec and Privileged Exec

Example To show all multicast router interfaces, use the command:

```
awplus# show ip igmp snooping mrrouter
```

To show the multicast router interfaces in vlan1, use the command:

```
awplus# show ip igmp snooping mrrouter interface vlan1
```

Output The following shows typical output.

Example output from show ip igmp snooping mrrouter

VLAN	Interface	Static/Dynamic
1	port1.0.1	Statically configured
200	port1.0.2	Statically configured

Example output from show ip igmp snooping mrrouter interface vlan1

VLAN	Interface	Static/Dynamic
1	port1.0.1	Statically configured

Related commands [ip igmp snooping mrrouter](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.

Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp snooping routermode

Overview Use this command to display the current router mode and the list of IP addresses set as router multicast addresses from the **ip igmp snooping routermode** command.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ip igmp snooping routermode

Mode User Exec and Privileged Exec

Example To show the router mode and the list of router multicast addresses, use the command:

```
awplus# show ip igmp snooping routermode
```

Output The following shows typical output.

Example output from show ip igmp snooping routermode

```
awplus#show ip igmp snooping routermode
Router mode.....Def
Reserved multicast address

    224.0.0.1
    224.0.0.2
    224.0.0.4
    224.0.0.5
    224.0.0.6
    224.0.0.9
    224.0.0.13
    224.0.0.15
    224.0.0.24
```

Related commands **ip igmp snooping routermode**

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp snooping source-timeout

Overview Use this command to display the configured IGMP snooping source timeouts for a specified VLAN or VLAN range.

Syntax `show ip igmp snooping source-timeout [interface] <interface-range>]`

Parameter	Description
<interface-range>	The name of the VLAN interface or VLAN range

Mode Privileged Exec

Example To display the configured IGMP snooping source timeouts for all VLANs, use the command:

```
awplus# show ip igmp snooping source-timeout
```

Output The following shows typical output.

Example output from show ip igmp snooping source-timeout

```
awplus#show ip igmp snooping source-timeout
Global IGMP snooping source-timeout is enabled (60 secs)

vlan1          enabled (300 secs)
vlan2          inherits global setting
vlan1000       inherits global settingawplus#show ip igmp snooping
source-timeout int vlan1
Global IGMP snooping source-timeout is enabled (60 secs)vlan1
enabled (300 secs)
```

Related commands [ip igmp snooping source-timeout](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.

Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip igmp snooping statistics

Overview Use this command to display IGMP Snooping statistics data.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ip igmp snooping statistics interface <interface-range> [group [<ip-address>]]`

Parameter	Description
<ip-address>	Optionally specify the address of the multicast group, entered in the form A.B.C.D.
<interface>	Specify the name of the interface or interface range. If you specify a port number, the output displays the number of groups the port belongs to, and the port's group membership limit, if a limit has been set (with the command ip igmp maximum-groups)

Mode Privileged Exec

Example To display IGMP statistical information for **vlan1** and **vlan2**, use the command:

```
awplus# show ip igmp snooping statistics interface vlan1-vlan2
```

Output The following shows typical output.

Example output from the show ip igmp snooping statistics command for VLANs

```
awplus#show ip igmp interface vlan1-vlan2
IGMP Snooping statistics for vlan1
Interface:    port1.0.1
Group:        224.1.1.1
Uptime:       00:00:09
Group mode:   Exclude (Expires: 00:04:10)
Last reporter: 10.4.4.5
Source list is empty
IGMP Snooping statistics for vlan2
Interface:    port1.0.2
Group:        224.1.1.2
Uptime:       00:00:19
Group mode:   Exclude (Expires: 00:05:10)
Last reporter: 10.4.4.6
Source list is empty
```

Example output from the show ip igmp snooping statistics command for a switch port

```
awplus#show ip igmp interface port1.0.1
IGMP information for port1.0.1
  Maximum groups limit set: 10
  Number of groups port belongs to: 0
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

undebbug igmp

Overview This command applies the functionality of the no **debug igmp**.

31

MLD and MLD Snooping Commands

- Contents**
- **Introduction** on page 1509
 - **clear ipv6 mld** on page 1510
 - **clear ipv6 mld group** on page 1511
 - **clear ipv6 mld interface** on page 1512
 - **debug mld** on page 1513
 - **ipv6 mld** on page 1514
 - **ipv6 mld access-group** on page 1515
 - **ipv6 mld immediate-leave** on page 1516
 - **ipv6 mld last-member-query-count** on page 1517
 - **ipv6 mld last-member-query-interval** on page 1518
 - **ipv6 mld limit** on page 1519
 - **ipv6 mld querier-timeout** on page 1521
 - **ipv6 mld query-interval** on page 1522
 - **ipv6 mld query-max-response-time** on page 1523
 - **ipv6 mld robustness-variable** on page 1524
 - **ipv6 mld snooping** on page 1525
 - **ipv6 mld snooping fast-leave** on page 1527
 - **ipv6 mld snooping mrouter** on page 1528
 - **ipv6 mld snooping querier** on page 1530
 - **ipv6 mld snooping report-suppression** on page 1531
 - **ipv6 mld ssm-map enable** on page 1533
 - **ipv6 mld ssm-map static** on page 1534
 - **ipv6 mld static-group** on page 1535
 - **ipv6 mld version** on page 1537
 - **show debugging mld** on page 1538
 - **show ipv6 mld groups** on page 1539
 - **show ipv6 mld interface** on page 1541
 - **show ipv6 mld snooping mrouter** on page 1542
 - **show ipv6 mld snooping statistics** on page 1543

Introduction

Overview This chapter provides an alphabetical reference of configuration, clear, and show commands related to MLD and MLD Snooping.

The Multicast Listener Discovery (MLD) module includes the MLD Proxy service and MLD Snooping functionality. Some of the following commands may have commonalities and restrictions; these are described under the Usage section for each command.

MLD and MLD Snooping commands only apply to switch ports, not Ethernet interfaces.

Before using PIM-SMv6:

- IPv6 must be enabled on an interface (**ipv6 enable**),
- IPv6 forwarding must be enabled globally for routing IPv6 (**ipv6 forwarding**), and
- IPv6 multicasting must be enabled globally (**ipv6 multicast-routing**).

clear ipv6 mld

Overview Use this command to clear all MLD local memberships on all interfaces.

Syntax `clear ipv6 mld`

Mode Privileged Exec

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols and learned by MLD Snooping.

Example To clear all MLD local memberships on all interfaces, use the command:

```
awplus# clear ipv6 mld
```

Related commands [clear ipv6 mld group](#)
[clear ipv6 mld interface](#)

clear ipv6 mld group

Overview Use this command to clear MLD specific local-membership(s) on all interfaces, for all groups or a particular group.

Syntax `clear ipv6 mld group {*|<ipv6-address>}`

Parameter	Description
*	Clears all groups on all interfaces. This is an alias to the clear ipv6 mld command.
<ipv6-address>	Specify the group address for which MLD local-memberships are to be cleared from all interfaces. Specify the IPv6 multicast group address in the format in the format X:X::X:X.

Mode Privileged Exec

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols and learned by MLD Snooping.

Example To clear all groups on all interfaces, use the command:

```
awplus# clear ipv6 mld group *
```

Related commands **clear ipv6 mld**
clear ipv6 mld interface

clear ipv6 mld interface

Overview Use this command to clear MLD interface entries.

Syntax `clear ipv6 mld interface <interface>`

Parameter	Description
<interface>	Specifies name of the interface; all groups learned from this interface are deleted.

Mode Privileged Exec

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols and learned by MLD Snooping.

Example To clear the entries from vlan2, use the command:

```
awplus# clear ipv6 mld interface vlan2
```

Related commands [clear ipv6 mld](#)
[clear ipv6 mld group](#)

debug mld

Overview Use this command to enable all MLD debugging modes, or a specific MLD debugging mode.

Use the **no** variant of this command to disable all MLD debugging modes, or a specific MLD debugging mode.

Syntax `debug mld {all|decode|encode|events|fsm|tib}`
`no debug mld {all|decode|encode|events|fsm|tib}`

Parameter	Description
all	Debug all MLD.
decode	Debug MLD decoding.
encode	Debug MLD encoding.
events	Debug MLD events.
fsm	Debug MLD Finite State Machine (FSM).
tib	Debug MLD Tree Information Base (TIB).

Mode Privileged Exec and Global Configuration

Usage notes This command applies to interfaces configured for MLD Layer 3 multicast protocols and learned by MLD Snooping.

Examples

```
awplus# configure terminal
awplus(config)# debug mld all
awplus# configure terminal
awplus(config)# debug mld decode
awplus# configure terminal
awplus(config)# debug mld encode
awplus# configure terminal
awplus(config)# debug mld events
```

Related commands [show debugging mld](#)

ipv6 mld

Overview Use this command to enable the MLD protocol operation on an interface. This command enables MLD protocol operation in stand-alone mode, and can be used to learn local-membership information prior to enabling a multicast routing protocol on the interface.

Use the **no** variant of this command to return all MLD related configuration to the default (including MLD Snooping).

NOTE:

There is a 100 MLD interface limit when applying MLD commands to multiple VLANs. Only the first 100 VLANs have the required multicast structures added to the interfaces that allow multicast routing.

Syntax `ipv6 mld`
`no ipv6 mld`

Default MLD is disabled by default.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes MLD requires memory for storing data structures, as well as the hardware tables to implement hardware routing. As the number of ports, VLANs, static and dynamic groups increases then more memory is consumed. You can track the memory used for MLD with the command:

```
awplus# show memory pools nsm | grep MLD
```

Static and dynamic groups (LACP), ports and VLANs are not limited for MLD. For VLANs, this allows you to configure MLD across more VLANs with fewer ports per VLAN, or fewer VLANs with more ports per VLAN. For LACPs, you can configure MLD across more LACP groups with fewer ports per LACP, or fewer LACP groups with more ports per LACP.

Example To enable MLD on vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan1
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld
```

Related commands [show ipv6 mld interface](#)

ipv6 mld access-group

Overview Use this command to control the multicast local-membership groups learned on an interface.

Use the **no** variant of this command to disable this access control.

Syntax `ipv6 mld access-group <IPv6-access-list-name>`
`no ipv6 mld access-group`

Parameter	Description
<code><IPv6-access-list-name></code>	Specify a Standard or an Extended software IPv6 access-list name. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Default No access list is configured by default.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Examples In the following example, the VLAN interface `vlan2` will only accept MLD joins for groups in the range `ff1e:0db8:0001::/64`:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard group1 permit
ff1e:0db8:0001::/64
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld access-group group1
```

In the following example, the VLAN interfaces `vlan2-vlan4` will only accept MLD joins for groups in the range `ff1e:0db8:0001::/64`:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard group1 permit
ff1e:0db8:0001::/64
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld access-group group1
```

ipv6 mld immediate-leave

Overview Use this command to minimize the leave latency of MLD memberships. Use the **no** variant of this command to disable this feature.

Syntax `ipv6 mld immediate-leave group-list <IPv6-access-list-name>`
`no ipv6 mld immediate-leave`

Parameter	Description
<code><IPv6-access-list-name></code>	Specify a Standard or an Extended software IPv6 access-list name that defines multicast groups in which the immediate leave feature is enabled. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Default Disabled

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Example The following example shows how to enable the immediate-leave feature on an interface for a specific range of multicast groups. In this example, the router assumes that the group access-list consists of groups that have only one node membership at a time per interface:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld immediate-leave v6grp
awplus(config-if)# exit
```

Related commands [ipv6 mld last-member-query-interval](#)

ipv6 mld last-member-query-count

Overview Use this command to set the last-member query-count value.
Use the **no** variant of this command to return to the default on an interface.

Syntax `ipv6 mld last-member-query-count <value>`
`no ipv6 mld last-member-query-count`

Parameter	Description
<value>	Count value. Valid values are from 2 to 7.

Default The default last-member query-count value is 2.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Example To set the last-member query-count to 3 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld last-member-query-count 3
```

ipv6 mld last-member-query-interval

Overview Use this command to configure the interval at which the router sends MLD group-specific host query messages.

Use the **no** variant of this command to set this frequency to the default.

Syntax `ipv6 mld last-member-query-interval <milliseconds>`
`no ipv6 mld last-member-query-interval`

Parameter	Description
<code><milliseconds></code>	The time delay between successive query messages (in milliseconds). Valid values are from 1000 to 25500 milliseconds.

Default 1000 milliseconds

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Example The following example changes the MLD group-specific host query message interval to 2 seconds:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld last-member-query-interval 2000
```

Related commands [ipv6 mld immediate-leave](#)

ipv6 mld limit

Overview Use this command to configure a limit on the maximum number of group memberships that may be learned. The limit may be set for the device as a whole, or for a specific interface.

Once the specified group membership limit is reached, all further local-memberships will be ignored.

Optionally, an exception access-list can be configured to specify the group-address(es) that are exempted from being subject to the limit.

Use the **no** variant of this command to unset the limit and any specified exception access-list.

Syntax `ipv6 mld limit <limitvalue> [except <IPv6-access-list-name>]`
`no ipv6 mld limit`

Parameter	Description
<limitvalue>	<2-512> Maximum number of group membership states.
<IPv6-access-list-name>	Specify a Standard or an Extended software IPv6 access-list name that defines multicast groups, which are exempted from being subject to the configured limit. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Default The default limit, which is reset by the **no** variant of this command, is the same as maximum number of group membership entries that can be learned with the **ipv6 mld limit** command.

The default limit of group membership entries that can be learned is 512 entries.

Mode Global Configuration and Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes This command applies to interfaces configured for MLD Layer-3 multicast protocols and learned by MLD Snooping.

Examples The following example configures an MLD limit of 100 group-memberships across all VLAN interfaces on which MLD is enabled, and excludes groups in the range ff1e:0db8:0001::/64 from this limitation:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard v6grp permit
ff1e:0db8:0001::/64
awplus(config)# ipv6 mld limit 100 except v6grp
```

The following example configures an MLD limit of 100 group-membership states on the VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld limit 100
```

The following example configures an MLD limit of 100 group-membership states on the VLAN interfaces vlan2-vlan4:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld limit 100
```

Related commands [ipv6 mld immediate-leave](#)
[show ipv6 mld groups](#)

ipv6 mld querier-timeout

Overview Use this command to configure the timeout period before the router takes over as the querier for the interface after the previous querier has stopped querying.

Use the **no** variant of this command to restore the default.

Syntax `ipv6 mld querier-timeout <seconds>`
`no ipv6 mld querier-timeout`

Parameter	Description
<seconds>	Number of seconds that the router waits after the previous querier has stopped querying before it takes over as the querier. Valid values are from 2 to 65535 seconds.

Default 255 seconds

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes This command applies to interfaces configured for MLD Layer 3 multicast protocols.

Example The following example configures the router to wait 120 seconds from the time it received the last query before it takes over as the querier for the interface:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld querier-timeout 120
```

Related commands [ipv6 mld query-interval](#)

ipv6 mld query-interval

Overview Use this command to configure the frequency of sending MLD host query messages.

Use the **no** variant of this command to return to the default frequency.

Syntax `ipv6 mld query-interval <seconds>`
`no ipv6 mld query-interval`

Parameter	Description
<seconds>	Variable that specifies the time delay between successive MLD host query messages (in seconds). Valid values are from 1 to 18000 seconds.

Default The default query interval is 125 seconds.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols.

Example The following example changes the frequency of sending MLD host-query messages to 2 minutes:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld query-interval 120
```

Related commands [ipv6 mld querier-timeout](#)

ipv6 mld query-max-response-time

Overview Use this command to configure the maximum response time advertised in MLD queries.

Use the **no** variant of with this command to restore the default.

Syntax `ipv6 mld query-max-response-time <seconds>`
`no ipv6 mld query-max-response-time`

Parameter	Description
<seconds>	Maximum response time (in seconds) advertised in MLD queries. Valid values are from 1 to 240 seconds.

Default 10 seconds

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols.

Example The following example configures a maximum response time of 8 seconds:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld query-max-response-time 8
```

ipv6 mld robustness-variable

Overview Use this command to change the robustness variable value on an interface.

Use the **no** variant of this command to return to the default on an interface.

Syntax `ipv6 mld robustness-variable <value>`
`no ipv6 mld robustness-variable`

Parameter	Description
<value>	Valid values are from 1 to 7.

Default The default robustness variable value is 2.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage This command applies to interfaces configured for MLD Layer 3 multicast protocols.

Example The following example changes the robustness variable value to 3:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld robustness-variable 3
```


ipv6 mld snooping

Overview Use this command to enable MLD Snooping. When this command is issued in the Global Configuration mode, MLD Snooping is enabled globally for the device. When this command is issued in Interface mode for a VLAN then MLD Snooping is enabled for the specified VLAN. Note that MLD Snooping is enabled on the VLAN only if it is enabled globally and on the VLAN.

Use the **no** variant of this command to globally disable MLD Snooping in Global Configuration mode, or for the specified VLAN interface in Interface mode.

NOTE: *There is a 100 MLD interface limit when applying MLD commands to multiple VLANs. Only the first 100 VLANs have the required multicast structures added to the interfaces that allow multicast routing.*

Syntax `ipv6 mld snooping`
`no ipv6 mld snooping`

Default By default, MLD Snooping is enabled both globally and on all VLANs.

Mode Global Configuration and Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes It is possible to disable MLD snooping globally or on a per-VLAN basis, using the command **no ipv6 mld snooping**. However, we recommend leaving MLD snooping enabled unless an Allied Telesis support representative tells you to disable it, even if you are not actively using the device for multicast.

For MLD Snooping to operate on particular VLAN interfaces, it must be enabled both globally by using this command in Global Configuration mode, and on individual VLAN interfaces by using this command in Interface Configuration mode (both are enabled by default).

MLD requires memory for storing data structures, as well as the hardware tables to implement hardware routing. As the number of ports, VLANs, static and dynamic groups increases then more memory is consumed. You can track the memory used for MLD with the command:

```
awplus# show memory pools nsm | grep MLD
```

Static and dynamic groups (LACP), ports and VLANs are not limited for MLD. For VLANs, this allows you to configure MLD across more VLANs with fewer ports per VLAN, or fewer VLANs with more ports per VLAN. For LACPs, you can configure MLD across more LACP groups with fewer ports per LACP, or fewer LACP groups with more ports per LACP.

Examples To configure MLD Snooping on the VLAN interfaces vlan2-vlan4, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 mld snooping
```

To disable MLD Snooping for the VLAN interfaces vlan2-vlan4, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config)# no ipv6 mld snooping
```

To configure MLD Snooping globally for the device, enter the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 mld snooping
```

To disable MLD Snooping globally for the device, enter the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 mld snooping
```

ipv6 mld snooping fast-leave

Overview Use this command to enable MLD Snooping fast-leave processing. Fast-leave processing is analogous to immediate-leave processing; the MLD group-membership is removed as soon as an MLD leave group message is received, without sending out a group-specific query.

Use the **no** variant of this command to disable fast-leave processing.

Syntax `ipv6 mld snooping fast-leave`
`no ipv6 mld snooping fast-leave`

Default MLD Snooping fast-leave processing is disabled.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes This MLD Snooping command can only be configured on VLAN interfaces.

Examples This example shows how to enable fast-leave processing on the VLAN interface `vlan2`.

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld snooping fast-leave
```

This example shows how to enable fast-leave processing on the VLAN interface `vlan2-vlan4`.

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 mld snooping fast-leave
```

ipv6 mld snooping mrouter

Overview Use this command to statically configure the specified port as a Multicast Router interface for MLD Snooping within the specified VLAN.

See detailed usage notes below to configure static multicast router ports when using static IPv6 multicast routes with EPSR, and the destination VLAN is an EPSR data VLAN.

Use the **no** variant of this command to remove the static configuration of the interface as a Multicast Router interface.

Syntax `ipv6 mld snooping mrouter interface <port>`
`no ipv6 mld snooping mrouter interface <port>`

Parameter	Description
<port>	Specify the name of the port.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage notes This MLD Snooping command statically configures a switch port as a Multicast Router interface.

Note that if static IPv6 multicast routing is being used with EPSR and the destination VLAN is an EPSR data VLAN, then multicast router (mrouter) ports must be statically configured. This minimizes disruption for multicast traffic in the event of ring failure or restoration.

When configuring the EPSR data VLAN, statically configure mrouter ports so that the multicast router can be reached in either direction around the EPSR ring.

For example, if port1.0.1 and port1.0.6 are ports on an EPSR data VLAN vlan101, which is the destination for a static IPv6 multicast route, then configure both ports as multicast router (mrouter) ports as shown in the example commands listed below:

Example
ipv6 mld
snooping
mrouter
commands
when
static IPv6
multicast
routing is
being used
and the
destination
VLAN is an
EPSR data
VLAN:

```
awplus>enable
awplus#configure terminal
awplus(config)#interface vlan101
awplus(config-if)#ipv6 mld snooping mrouter interface port1.0.1
awplus(config-if)#ipv6 mld snooping mrouter interface port1.0.6
```

Examples This example shows how to specify the next-hop interface to the multicast router for VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld snooping mrouter interface port1.0.5
```

This example shows how to specify the next-hop interface to the multicast router for VLAN interfaces vlan2-vlan4:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 mld snooping mrouter interface port1.0.5
```

Related commands [ipv6 multicast route](#)

ipv6 mld snooping querier

Overview Use this command to enable MLD querier operation on a subnet (VLAN) when no multicast routing protocol is configured in the subnet (VLAN). When enabled, the MLD Snooping querier sends out periodic MLD queries for all interfaces on that VLAN.

Use the **no** variant of this command to disable MLD querier configuration.

Syntax `ipv6 mld snooping querier`
`no ipv6 mld snooping querier`

Mode Interface Configuration for a specified VLAN interface.

Usage This command can only be configured on a single VLAN interface - not on multiple VLANs.

The MLD Snooping querier uses the 0.0.0.0 Source IP address because it only masquerades as an MLD querier for faster network convergence.

The MLD Snooping querier does not start, or automatically cease, the MLD Querier operation if it detects query message(s) from a multicast router. It restarts as an MLD Snooping querier if no queries are seen within the other querier interval.

Do not enable MLD Snooping querier if you have already enabled MLD on your device.

Do not enable MLD Snooping querier on your device and then enable MLD afterwards.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ipv6 mld snooping querier`

ipv6 mld snooping report-suppression

Overview Use this command to enable report suppression from hosts for Multicast Listener Discovery version 1 (MLDv1) on a VLAN in Interface Configuration mode.

Use the **no** variant of this command to disable report suppression on a VLAN in Interface Configuration mode.

Syntax `ipv6 mld snooping report-suppression`
`no ipv6 mld snooping report-suppression`

Default Report suppression does not apply to MLDv2, and is turned on by default for MLDv1 reports.

Mode Interface Configuration for a specified VLAN interface or a range of VLAN interfaces.

Usage This MLD Snooping command can only be configured on VLAN interfaces. MLDv1 Snooping may be configured to suppress reports from hosts. When a querier sends a query, only the first report for particular set of group(s) from a host will be forwarded to the querier by the MLD Snooping device. Similar reports (to the same set of groups) from other hosts, which would not change group memberships in the querier, will be suppressed by the MLD Snooping device to prevent 'flooding' of query responses.

Examples This example shows how to enable report suppression for MLD reports on VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld snooping report-suppression
```

This example shows how to disable report suppression for MLD reports on VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 mld snooping report-suppression
```

This example shows how to enable report suppression for MLD reports on VLAN interfaces vlan2-vlan4:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ipv6 mld snooping report-suppression
```

This example shows how to disable report suppression for MLD reports on VLAN interfaces vlan2-vlan4:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# no ipv6 mld snooping report-suppression
```


ipv6 mld ssm-map enable

Overview Use this command to enable the Source Specific Multicast (SSM) mapping feature on the device.

Use the **no** variant of this command to disable the SSM mapping feature on the device.

Syntax `ipv6 mld ssm-map enable`
`no ipv6 mld ssm-map enable`

Mode Global Configuration

Usage notes This command enables the SSM mapping feature for group members in the defined SSM range. Configure the group member and the SSM range using the **ipv6 mld ssm-map static** command.

Example This example shows how to enable the MLD SSM mapping feature on the device.

```
awplus# configure terminal
awplus(config)# ipv6 mld ssm-map enable
```

Related commands **ipv6 mld ssm-map static**

ipv6 mld ssm-map static

Overview Use this command to statically define a Source Specific Multicast (SSM) mapping. The SSM mapping statically assigns sources to MLDv1 groups to translate such (*,G) groups' memberships to (S,G) memberships for use with PIM-SSM.

Use the **no** variant of this command to remove the SSM map association.

Syntax `ipv6 mld ssm-map static <access-list-name> X:X::X:X`
`no ipv6 mld ssm-map static <access-list-name> X:X::X:X`

Parameter	Description
<access-list-name>	IPv6 named standard access-list.
X:X::X:X	IPv6 source address that is associated with the above access-list. The IPv6 address uses the format X:X::X:X.

Mode Global Configuration

Usage notes Use this command to configure SSM mappings after enabling SSM mapping with the **ipv6 mld ssm-map enable** command.

Example This example shows how to configure an SSM static mapping for the group-address ff0e::1/128.

```
awplus# configure terminal
awplus(config)# ipv6 mld ssm-map enable
awplus(config)# ipv6 access-list standard v6grp permit
ff0e::1/128
awplus(config)# ipv6 mld ssm-map static v6grp 2006::3
```

Related commands **ipv6 mld ssm-map enable**

ipv6 mld static-group

Overview Use this command to statically configure IPv6 group membership entries on an interface. To statically add only a group membership, do not specify any parameters.

Use the **no** variant of this command to delete static group membership entries.

Syntax `ipv6 mld static-group <ipv6-group-address> [source <ipv6-source-address>|ssm-map] [interface <port>]`
`no ipv6 mld static-group <ipv6-group-address> [source <ipv6-source-address>|ssm-map] [interface <port>]`

Parameter	Description
<code><ipv6-group-address></code>	Specify a standard IPv6 Multicast group address to be configured as a static group member. The IPv6 address uses the format X:X::X:X.
<code><ipv6-source-address></code>	Optional. Specify a standard IPv6 source address to be configured as a static source from where multicast packets originate. The IPv6 address uses the format X:X::X:X.
<code>ssm-map</code>	Mode of defining SSM mapping. SSM mapping statically assigns sources to MLDv1 groups to translate these (*,G) groups' memberships to (S,G) memberships for use with PIM-SSM.
<code><port></code>	Optional. Physical interface. This parameter specifies a physical port. If this parameter is used, the static configuration is applied to just that physical interface. If this parameter is not used, the static configuration is applied on all interfaces in the group.

Mode Interface Configuration for a specified VLAN interface.

Usage notes This command applies to MLD Snooping on a VLAN interface to statically add groups and/or source records.

Examples To add a static group record, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld static-group ff1e::10
```

To add a static group and source record, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld static-group ff1e::10 source
fe80::2fd:6cff:fe1c:b
```

To add a static group record on a specific port on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld static-group ff1e::10
interface port1.0.8
```

To add an SSM mapping record on a specific port on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 mld static-group ff1e::10 source ssm-map
interface port1.0.8
```

ipv6 mld version

Overview Use this command to set the current MLD protocol version on an interface. Use the **no** variant of this command to return to the default version on an interface.

Syntax `ipv6 mld version <version>`
`no ipv6 mld version`

Parameter	Description
<version>	MLD protocol version number. Valid version numbers are 1 and 2

Default The default MLD protocol version number is 2.

Mode Interface Configuration for a specified VLAN interface.

Usage notes This command applies to interfaces configured for MLD Layer 3 multicast protocols and MLD Snooping.

Note this command is intended for use where there is another querier (when there is another device with MLD enabled) on the same link that can only operate with MLD version 1. Otherwise, the default MLD version 2 is recommended for performance.

Example To set the MLD protocol version to 1, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 mld version 1
```

show debugging mld

Overview Use this command to see what debugging is turned on for MLD. MLD debugging modes are enabled with the **debug mld** command.

For information on filtering and saving command output, see the **[“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide.](#)**

Syntax show debugging mld

Mode Privileged Exec

Example awplus# show debugging mld

Output The following shows typical output.

Example output for show debugging mld

```
show debugging mld
MLD Debugging status:
  MLD Decoder debugging is on
  MLD Encoder debugging is on
  MLD Events debugging is on
  MLD FSM debugging is on
  MLD Tree-Info-Base (TIB) debugging is on
```

Related commands **debug mld**

show ipv6 mld groups

Overview Use this command to display the multicast groups that have receivers directly connected to the router and learned through MLD.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax `show ipv6 mld groups [<ipv6-address>|<interface>] [detail]`

Parameter	Description
<ipv6-address>	Optional. Specify the address of the multicast group in format X:X::X:X.
<interface>	Optional. The interface to display information about.
detail	Display more detailed information.

Mode User Exec and Privileged Exec

Examples The following command displays local-membership information for all interfaces:

```
awplus# show ipv6 mld groups
```

The following command displays detailed local-membership information for all interfaces:

```
awplus# show ipv6 mld groups detail
```

Output The following shows typical output.

Example output for show ipv6 mld groups

```
awplus#show ipv6 mld groups
MLD Connected Group Membership
Group Address      Interface          Uptime    Expires    Last Reporter
ff08::1            vlan10 (port1.0.1) 00:07:27  00:03:10   fe80::200:1ff:fe20:b5ac
```

Example output for show ipv6 mld groups detail

```
awplus# show ipv6 mld groups detail
MLD Connected Group Membership Details for port1.0.1
Interface:          port1.0.1
Group:              ff08::1
Uptime:             00:00:13
Group mode:         Include ( )
Last reporter:      fe80::eecd:6dff:fe6b:4783
Group source list: (R - Remote, M - SSM Mapping, S - Static )
Source Address      Uptime    v2 Exp    Fwd  Flags
2001:db8::1         00:00:13  00:04:07  Yes  R
2002:db8::3         00:00:13  00:04:07  Yes  R
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 mld interface

Overview Use this command to display the state of MLD and MLD Snooping for a specified interface, or all interfaces.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 mld interface [<interface>]

Parameter	Description
<interface>	Optionally, an interface to display information about.

Mode User Exec and Privileged Exec

Example The following command displays MLD interface status on all interfaces enabled for MLD:

```
awplus# show ipv6 mld interface
```

Output The following shows typical output.

Example output for show ipv6 mld interface

```
awplus#show ipv6 mld interface
Interface vlan1 (Index 301)
  MLD Enabled, Active, Querier, Version 2 (default)
  Internet address is fe80::215:77ff:fec9:7468
  MLD interface has 0 group-record states
  MLD activity: 0 joins, 0 leaves
  MLD robustness variable is 2
  MLD last member query count is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1000 milliseconds
  Group Membership interval is 260 seconds
  MLD Snooping is globally enabled
  MLD Snooping is enabled on this interface
  MLD Snooping fast-leave is not enabled
  MLD Snooping querier is enabled
  MLD Snooping report suppression is enabled
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 mld snooping mrouter

Overview Use this command to display the multicast router interfaces, both configured and learned, in a VLAN. If you do not specify a VLAN interface then all the VLAN interfaces are displayed.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 mld snooping mrouter [<interface>]

Parameter	Description
<interface>	Optionally, an interface to display information about.

Mode User Exec and Privileged Exec

Example To display the multicast router interfaces in vlan2, use the command:

```
awplus# show ipv6 mld snooping mrouter vlan2
```

To display the multicast router interfaces for all VLAN interfaces, use the command:

```
awplus# show ipv6 mld snooping mrouter
```

Output The following shows typical output.

Example output for show ipv6 mld snooping mrouter vlan2

```
awplus#show ipv6 mld snooping mrouter vlan2
VLAN    Interface    Static/Dynamic
2       port1.0.2    Dynamically Learned
2       port1.0.3    Dynamically Learned
```

Example output for show ipv6 mld snooping mrouter

```
awplus#show ipv6 mld snooping mrouter
VLAN    Interface    Static/Dynamic
2       port1.0.2    Dynamically Learned
2       port1.0.3    Dynamically Learned
3       port1.0.4    Statically Assigned
3       port1.0.5    Statically Assigned
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 mld snooping statistics

Overview Use this command to display MLD Snooping statistics data.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus”_Feature Overview and Configuration Guide](#).

Syntax show ipv6 mld snooping statistics interface <interface>

Parameter	Description
<interface>	The interface to display information about.

Mode User Exec and Privileged Exec

Example To display MLDv2 statistical information for an interface, use the command:

```
awplus# show ipv6 mld snooping statistics interface vlan1
```

Output The following shows typical output.

Example output for show ipv6 mld snooping statistics interface vlan1

```
awplus#show ipv6 mld snooping statistics interface vlan1
MLD Snooping statistics for vlan1
Interface:      port1.0.1
Group:         ff08::1
Uptime:        00:02:18
Group mode:    Include ( )
Last reporter: fe80::eecd:6dff:fe6b:4783
Group source list: (R - Remote, M - SSM Mapping, S - Static )
Source Address      Uptime    v2 Exp    Fwd  Flags
2001:db8::1         00:02:18  00:02:02  Yes  R
2001:db8::3         00:02:18  00:02:02  Yes  R
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

32

Multicast Commands

- Contents**
- **Introduction** on page 1545
 - **clear ip mroute** on page 1546
 - **clear ip mroute statistics** on page 1548
 - **clear ip multicast route** on page 1549
 - **clear ipv6 mroute** on page 1550
 - **clear ipv6 mroute statistics** on page 1551
 - **ipv6 multicast forward-slow-path-packet** on page 1552
 - **debug nsm** on page 1553
 - **debug nsm mcast** on page 1554
 - **debug nsm mcast6** on page 1555
 - **ip mroute** on page 1556
 - **ip multicast allow-register-fragments** on page 1558
 - **ip multicast forward-first-packet** on page 1559
 - **ip multicast handle-igmp-immediately** on page 1560
 - **ip multicast route** on page 1561
 - **ip multicast route-limit** on page 1564
 - **ip multicast wrong-vif-suppression** on page 1565
 - **ip multicast-routing** on page 1566
 - **ipv6 mroute** on page 1567
 - **ipv6 multicast route** on page 1569
 - **ipv6 multicast route-limit** on page 1572
 - **ipv6 multicast-routing** on page 1573
 - **multicast** on page 1574
 - **platform l2mc-overlap** on page 1575
 - **platform l2mc-table mode** on page 1576
 - **platform multicast-ratelimit** on page 1579
 - **platform stop-unreg-mc-flooding** on page 1580
 - **show debugging nsm mcast** on page 1582
 - **show ip mroute** on page 1583
 - **show ip mvif** on page 1586
 - **show ip rpf** on page 1587
 - **show ipv6 mif** on page 1588
 - **show ipv6 mroute** on page 1589
 - **show ipv6 multicast forwarding** on page 1591

Introduction

Overview This chapter provides an alphabetical reference of multicast commands for configuring:

- IPv4 and IPv6 multicast forwarding
- IPv4 and IPv6 static multicast routes
- mroutes (routes back to a multicast source)

For commands for other multicast protocols, see:

- **IGMP and IGMP Snooping Commands**
- **MLD and MLD Snooping Commands**
- **PIM-SM Commands**
- **PIM-SMv6 Commands**
- **PIM-DM Commands**

NOTE:

*Before using PIM-SMv6 commands, IPv6 must be enabled on an interface with the **ipv6 enable** command, IPv6 forwarding must be enabled globally for routing IPv6 with the **ipv6 forwarding** command, and IPv6 multicasting must be enabled globally with the **ipv6 multicast-routing** command.*

*Static IPv6 multicast routes take priority over dynamic IPv6 multicast routes. Use the **clear ipv6 mroute** command to clear static IPv6 multicast routes and ensure dynamic IPv6 multicast routes can take over from previous static IPv6 multicast routes.*

The IPv6 Multicast addresses shown can be derived from IPv6 unicast prefixes as per RFC 3306. The IPv6 unicast prefix reserved for documentation is 2001:0db8::/32 as per RFC 3849. Using the base /32 prefix the IPv6 multicast prefix for 2001:0db8::/32 is ff3x:20:2001:0db8::/64. Where an RP address is 2001:0db8::1 the embedded RP multicast prefix is ff7x:120:2001:0db8::/96.

The IPv6 addresses shown use the address space 2001:0db8::/32, defined in RFC 3849 for documentation purposes. These addresses should not be used for practical networks (other than for testing purposes) nor should they appear on any public network.

clear ip mroute

Overview Use this command to delete one or more dynamically-added route entries from the IPv4 multicast routing table.

You need to do this if, for example, you want to create a static route instead of an existing dynamic route.

NOTE: *If you use this command, you should also use the command to clear IGMP group membership records.*

Syntax `clear ip mroute {*|<ipv4-group-address> [<ipv4-source-address>]}
[pim sparse-mode]`

Parameter	Description
*	Deletes all dynamically-learned IPv4 multicast routes.
<ipv4-group-address>	Group IPv4 address, in dotted decimal notation in the format A.B.C.D.
<ipv4-source-address>	Source IPv4 address, in dotted decimal notation in the format A.B.C.D.
pim sparse-mode	Clear specified IPv4 multicast route(s) for PIM Sparse Mode only.

Mode Privileged Exec

Usage notes When this command is used, the Multicast Routing Information Base (MRIB) clears the specified dynamic IPv4 multicast route entries in its IPv4 multicast route table, and deletes the entries from the multicast forwarder. The MRIB also sends a “clear” message to the relevant multicast protocols.

This command does not delete static routes from the routing table or the configuration. To delete static routes, use the **no** parameter of the command **ip multicast route**, or the command **clear ip multicast route**.

Examples To delete a specific dynamic route (from 192.168.3.3 for the group 225.1.1.1), use the command:

```
awplus# clear ip mroute 225.1.1.1 192.168.3.3
```

To delete all dynamic multicast routes, use the command:

```
awplus# clear ip mroute *
```

Related commands **clear ip multicast route**
ip multicast route
show ip mroute

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

clear ip mroute statistics

Overview Use this command to delete multicast route statistics entries from the IP multicast routing table.

Syntax `clear ip mroute statistics {*|<ipv4-group-addr> [<ipv4-source-addr>]}`

Parameter	Description
*	Deletes all dynamically-learned IPv4 multicast routes.
<ipv4-group-address>	Group IPv4 address, in dotted decimal notation in the format A.B.C.D.
<ipv4-source-address>	Source IPv4 address, in dotted decimal notation in the format A.B.C.D.

Mode Privileged Exec

Example `awplus# clear ip mroute statistics 225.1.1.2 192.168.4.4`
`awplus# clear ip mroute statistics *`

clear ip multicast route

Overview Use this command to delete all user-added static IPv4 multicast routes.

Syntax clear ip multicast route *

Parameter	Description
*	Deletes all static IPv4 multicast routes.

Mode Privileged Exec

Usage notes This command deletes all static IPv4 multicast routes from the routing table. To delete a single static route, use the **no** parameter of the command **ip multicast route**. To delete dynamic routes, use the command **clear ip mroute**.

Example To delete all static IPv4 multicast route entries, use the command:

```
awplus# clear ip multicast route *
```

Related commands **clear ip mroute**
ip multicast route
show ip mroute

clear ipv6 mroute

Overview Use this command to delete one or more dynamically-added route entries from the IPv6 multicast routing table.

You need to do this if, for example, you want to create a static route instead of an existing dynamic route.

NOTE: *If you use this command, you should also use the command to clear MLD group membership records.*

Syntax `clear ipv6 mroute [*|<ipv6-group-address> [<ipv6-source-address>]] [pim sparse-mode]`

Parameter	Description
*	Deletes all dynamically-learned IPv6 multicast routes.
<ipv6-group-address>	Group IPv6 address, in hexadecimal notation in the format X.X::X.X.
<ipv6-source-address>	Source IPv6 address, in hexadecimal notation in the format X.X::X.X.
pim sparse-mode	Clear specified IPv6 multicast route(s) for PIM Sparse Mode only.

Mode Privileged Exec

Usage notes When this command is used, the Multicast Routing Information Base (MRIB) clears the specified dynamic IPv6 multicast route entries in its IPv6 multicast route table, and deletes the entries from the multicast forwarder. The MRIB also sends a “clear” message to the relevant multicast protocols.

This command does not delete static routes from the routing table or the configuration. To delete static routes, use the **no** parameter of the command [ipv6 multicast route](#).

Examples To delete a specific dynamic route (from ff08::1 for the group 2001::2), use the command:

```
awplus# clear ipv6 mroute 2001::2 ff08::1
```

To delete all dynamic multicast routes, use the command:

```
awplus# clear ipv6 mroute *
```

Related commands [ipv6 multicast route](#)
[show ipv6 mroute](#)

clear ipv6 mroute statistics

Overview Use this command to delete multicast route statistics entries from the IPv6 multicast routing table.

Syntax `clear ipv6 mroute statistics {*|<ipv6-group-address> [<ipv6-source-address>]}`

Parameter	Description
<code>*</code>	All multicast route entries.
<code><ipv6-group-addr></code>	Group IPv6 address, in hexadecimal notation in the format X.X::X.X.
<code><ipv6-source-addr></code>	Source IPv6 address, in hexadecimal notation in the format X.X::X.X.

Mode Privileged Exec

Examples `awplus# clear ipv6 mroute statistics 2001::2 ff08::1`
`awplus# clear ipv6 mroute statistics *`

ipv6 multicast forward-slow-path-packet

Overview Use this command to enable multicast packets to be forwarded to the CPU. Enabling this command will ensure that the Layer 3 MTU is set correctly for each IP multicast group and will apply the value of the smallest MTU among the outgoing interfaces for the multicast group.

It will also ensure that a received packet that is larger than the MTU value will result in the generation of an ICMP Too Big message.

Use the **no** variant of this command to disable the above functionality.

Syntax `ipv6 multicast forward-slow-path-packet`
`no ipv6 multicast forward-slow-path-packet`

Default Disabled.

Mode Privileged Exec

Example To enable the ipv6 multicast forward-slow-path-packet function, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast forward-slow-path-packet
```

Related commands [show ipv6 forwarding](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

debug nsm

Overview This command specifies a set of debug options for use by Allied Telesis authorized service personnel only.

Use the **no** variant of this command to remove debug options.

Syntax debug nsm [all|events|ha|kernel]
no debug nsm [all|events|ha|kernel]

Parameter	Description
all	Enables all the nsm debugging options
events	Enables the nsm events debugging options
ha	Enables the nsm high availability debugging options
kernel	Enables the nsm kernel debugging options

Mode Global Configuration, Privileged Exec

Usage notes This command is intended for use by Allied Telesis authorized service personnel for diagnostic purposes.

Related commands [show debugging nsm mcast](#)

Command changes Version 5.4.7-2.1 command added.

debug nsm mcast

Overview Use this command to debug IPv4 events in the Multicast Routing Information Base (MRIB).

This command is intended for use by Allied Telesis authorized service personnel for diagnostic purposes.

Syntax debug nsm mcast {all|fib-msg|mrt|mtrace|mtrace-detail|register|stats|vif}

Parameter	Description
all	All IPv4 multicast debugging.
fib-msg	Forwarding Information Base (FIB) messages.
mrt	Multicast routes.
mtrace	Multicast traceroute.
mtrace-detail	Multicast traceroute detailed debugging.
register	Multicast PIM register messages.
stats	Multicast statistics.
vif	Multicast interface.

Mode Privileged Exec and Global Configuration

Examples To enable debugging of all multicast route events, use the commands:

```
awplus# configure terminal
awplus(config)# debug nsm mcast all
```

To enable debugging of PIM register entries, use the commands:

```
awplus# configure terminal
awplus(config)# debug nsm mcast register
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

debug nsm mcast6

Overview Use this command to debug IPv6 events in the Multicast Routing Information Base (MRIB).

This command is intended for use by Allied Telesis authorized service personnel for diagnostic purposes.

Syntax debug nsm mcast6 {all|fib-msg|mrt|register|stats|vif}
no debug nsm mcast6 {all|fib-msg|mrt|register|stats|vif}

Parameter	Description
all	All IPv6 multicast route debugging.
fib-msg	Forwarding Information Base (FIB) messages.
mrt	Multicast routes.
register	Multicast PIM register messages.
stats	Multicast statistics.
vif	Multicast interfaces.

Mode Privileged Exec and Global Configuration

Examples To enable debugging of all multicast route events, use the commands:

```
awplus# configure terminal
awplus(config)# debug nsm mcast6 all
```

To enable debugging of PIM register entries, use the commands:

```
awplus# configure terminal
awplus(config)# debug nsm mcast6 register
```

ip mroute

Overview Use this command to inform multicast of the RPF (Reverse Path Forwarding) route to a given IPv4 multicast source.

Use the **no** variant of this command to delete a route to an IPv4 multicast source.

Syntax `ip mroute <ipv4-source-address/mask-length> [ospf|rip|static]
<rpf-address> [<admin-distance>]`
`no ip mroute <ipv4-source-address/mask-length> [ospf|rip|static]`

Parameter	Description
<i><ipv4-source-address/mask-length></i>	A multicast source IPv4 address and mask length, in dotted decimal notation in the format A.B.C.D/M.
ospf	OSPF unicast routing protocol.
rip	RIP unicast routing protocol.
static	Specifies a static route.
<i><rpf-address></i>	A.B.C.D The closest known address on the multicast route back to the specified source. This host IPv4 address can be within a directly connected subnet or within a remote subnet. In the case that the address is in a remote subnet, a lookup is done from the unicast route table to find the next hop address on the path to this host.
<i><admin-distance></i>	The administrative distance. Use this to determine whether the RPF lookup selects the unicast or multicast route. Lower distances have preference. If the multicast static route has the same distance as the other RPF sources, the multicast static route takes precedence. The default is 0 and the range available is 0-255.

Mode Global Configuration

Usage notes Typically, when a Layer 3 multicast routing protocol is determining the RPF (Reverse Path Forwarding) interface for the path to an IPv4 multicast source, it uses the unicast route table to find the best path to the source. However, in some networks a deliberate choice is made to send multicast via different paths to those used for unicast. In this case, the interface via which a multicast stream from a given source enters a router may not be the same as the interface that connects to the best unicast route to that source.

This command enables the user to statically configure the device with “multicast routes” back to given sources. When performing the RPF check on a stream from a given IPv4 source, the multicast routing protocol will look at these static entries as well as looking into the unicast routing table. The route with the lowest administrative distance - whether a static “multicast route” or a route from the unicast route table - will be chosen as the RPF route to the source.

Note that in this context the term “multicast route” does not imply a route via which the current router will forward multicast; instead it refers to the route the multicast will have traversed in order to arrive at the current router.

Examples The following example creates a static multicast IPv4 route back to the sources in the 10.10.3.0/24 subnet. The multicast route is via the host 192.168.2.3, and has an administrative distance of 2:

```
awplus# configure terminal
awplus(config)# ip mroute 10.10.3.0/24 static 2 192.168.2.3 2
```

The following example creates a static multicast IPv4 route back to the sources in the 192.168.3.0/24 subnet. The multicast route is via the host 10.10.10.50. The administrative distance on this route has the default value of 0:

```
awplus# configure terminal
awplus(config)# ip mroute 192.168.3.0/24 10.10.10.50
```

Validation **clear ip mroute**
Commands **show ip mroute**
show ip rpf

ip multicast allow-register-fragments

Overview Use this command to allow PIM to register fragmented packets. It is disabled by default.

Use the **no** variant of this command to stop PIM from registering fragmented packets.

Syntax `ip multicast allow-register-fragments`
`no ip multicast allow-register-fragments`

Default This command is disabled by default

Mode Global Configuration

Usage notes Most multicast streams are not fragmented, and therefore this command is unnecessary. By default, when IP multicast packets are fragmented, the switch attempts to reassemble them before registering the packets. This is necessary for tasks such as network address translation, or a firewall.

However, reassembly may be difficult for switches where the CPU cannot handle a large amount of traffic. In that situation, with the CPU failing to reassemble the fragmented packets, there can be a delay in forwarding multicast streams.

We do not recommend enabling this feature if a firewall or network address translation is being used. This feature should only be enabled if multicast data is fragmented and the data rate is too high for the CPU to manage reassembly.

Example To allow PIM to register fragmented packets, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast allow-register-fragments
```

ip multicast forward-first-packet

Overview Use this command to enable multicast to forward the first multicast packets coming to the device.

Use the **no** variant of this command to disable this feature.

Syntax ip multicast forward-first-packet
no ip multicast forward-first-packet

Default By default, this feature is disabled.

Mode Global Configuration

Usage notes If this command is enabled, the device will forward the first packets in a multicast stream that create the multicast route, possibly causing degradation in the quality of the multicast stream, such as the pixelation of video and audio data.

NOTE: *If you use this command, ensure that the command is enabled, the default setting, otherwise the device will not process the first packets of the multicast stream correctly.*

The device will forward the first multicast packets to all interfaces which are on the same VLAN as those which asked for this multicast group.

Examples To enable the forwarding of the first multicast packets, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast forward-first-packet
```

To disable the forwarding of the first multicast packets, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip multicast forward-first-packet
```

ip multicast handle-igmp-immediately

Overview Use this command to allow traffic to be switched as soon as an IGMP report is received.

Use the **no** variant of this command to revert to the default setting.

Syntax ip multicast handle-igmp-immediately
no ip multicast handle-igmp-immediately

Default Turned off. This means that traffic will be switched after either a 1 second delay or if the IGMP buffer fills with 250 packets.

Mode Global Configuration

Example To turn on this feature, use the commands:
awplus# configure terminal
awplus(config)# ip multicast handle-igmp-immediately

Related commands [show running-config](#)

Command changes Supported since software version 5.4.9-2.0

ip multicast route

Overview Use this command to add an IPv4 static multicast route for a specific multicast source and group IPv4 address to the multicast Routing Information Base (RIB). This IPv4 multicast route is used to forward multicast traffic from a specific source and group ingressing on an upstream interface to a single or range of downstream interfaces.

Use the **no** variant of this command to either remove an IPv4 static multicast route set with this command or to remove a specific downstream interface from an IPv4 static multicast route for a specific multicast source and group IPv4 address.

Syntax `ip multicast route <ipv4-source-addr> <ipv4-group-addr>
<upstream-interface> [<downstream-interface>]`
`no ip multicast route <ipv4-source-addr> <ipv4-group-addr>
[<upstream-interface> <downstream-interface>]`

Parameter	Description
<code><ipv4-source-addr></code>	Source IPv4 address, in dotted decimal notation in the format A.B.C.D.
<code><ipv4-group-addr></code>	Group IPv4 address, in dotted decimal notation in the format A.B.C.D.
<code><upstream-interface></code>	Upstream interface on which the multicast packets ingress.
<code><downstream-interface></code>	Downstream interface or range of interfaces to which the multicast packets are sent.

Default By default, this feature is disabled.

Mode Global Configuration

Usage notes Only one multicast route entry per IPv4 address and multicast group can be specified. Therefore, if one entry for a static multicast route is configured, PIM will not be able to update this multicast route in any way.

If a dynamic multicast route exists you cannot create a static multicast route with the same source IPv4 address, group IPv4 address, upstream interface and downstream interfaces. An error message is displayed and logged. To add a new static multicast route, either wait for the dynamic multicast route to timeout or clear the dynamic multicast route with the **clear ip mroute** command.

To update an existing static multicast route entry with more or a new set of downstream interfaces, you must first remove the existing static multicast route and then add the new static multicast route with all downstream interfaces specified. If you attempt to update an existing static multicast route entry with an additional interface or interfaces, an error message is displayed and logged.

To create a blackhole or null route where packets from a specified source and group address coming from an upstream interface are dropped rather than forwarded, do not specify the optional *<downstream-interface>* parameter when entering this command.

To remove a specific downstream interface from an existing static multicast route entry, specify the interface you want to remove with the *<downstream-interface>* parameter when entering the **no** variant of this command.

Examples To create a static multicast route for the multicast source IPv4 address 2.2.2.2 and group IPv4 address 224.9.10.11, specifying the upstream VLAN interface as vlan10 and the downstream VLAN interface as vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast route 2.2.2.2 224.9.10.11 vlan10
vlan20
```

To create a blackhole route for the multicast source IPv4 address 2.2.2.2 and group IPv4 address 224.9.10.11, specifying the upstream VLAN interface as vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast route 2.2.2.2 224.9.10.11 vlan10
```

To create an IPv4 static multicast route for the multicast source IPv4 address 2.2.2.2 and group IP address 224.9.10.11, specifying the upstream VLAN interface as vlan10 and the downstream VLAN range as vlan20-25, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast route 2.2.2.2 224.9.10.11 vlan10
vlan20-25
```

To remove the downstream VLAN 23 from the IPv4 static multicast route created with the above command, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip multicast route 2.2.2.2 224.9.10.11 vlan10
vlan23
```

To delete an IPv4 static multicast route for the multicast source IP address 2.2.2.2 and group IP address 224.9.10.11, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip multicast route 2.2.2.2 224.9.10.11
```

Related commands [clear ip mroute](#)
[clear ip multicast route](#)
[show ip mroute](#)

ip multicast route-limit

Overview Use this command to limit the number of multicast routes that can be added to an IPv4 multicast routing table.

Use the **no** variant of this command to return the IPv4 route limit to the default.

Syntax `ip multicast route-limit <limit> [<threshold>]`
`no ip multicast route-limit`

Parameter	Description
<limit>	<1-2147483647> Number of routes.
<threshold>	<1-2147483647> Threshold above which to generate a warning message. The mroute warning threshold must not exceed the mroute limit.

Default The default limit and threshold value is 2147483647.

Mode Global Configuration

Usage notes This command limits the number of multicast IPv4 routes (mroutes) that can be added to a router, and generates an error message when the limit is exceeded. If the threshold parameter is set, a threshold warning message is generated when this threshold is exceeded, and the message continues to occur until the number of mroutes reaches the limit set by the limit argument.

Examples `awplus# configure terminal`
`awplus(config)# ip multicast route-limit 34 24`
`awplus# configure terminal`
`awplus(config)# no ip multicast route-limit`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip multicast wrong-vif-suppression

Overview Use this command to prevent unwanted multicast packets received on an unexpected interface being trapped to the CPU.

Use the no variant of this command to disable wrong VIF suppression.

Syntax ip ip multicast wrong-vif-suppression
no ip multicast wrong-vif-suppression

Default By default, this feature is disabled.

Mode Global Configuration

Usage notes Use this command if there is excessive CPU load and multicast traffic is enabled. To confirm that VIF messages are being sent to the CPU use the **debug nsm mcast6** command.

Examples To enable the suppression of wrong VIF packets, use the following commands:

```
awplus# configure terminal
awplus(config)# ip multicast wrong-vif-suppression
```

To disable the suppression of wrong VIF packets, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip multicast wrong-vif-suppression
```

ip multicast-routing

Overview Use this command to turn on/off IPv4 multicast routing on the router; when turned off the device does not perform multicast functions.

Use the **no** variant of this command to disable IPv4 multicast routing after enabling it. Note the default stated below.

Syntax `ip multicast-routing`
`no ip multicast-routing`

Default By default, IPv4 multicast routing is off.

Mode Global Configuration

Usage notes When the **no** variant of this command is used, the Multicast Routing Information Base (MRIB) cleans up Multicast Routing Tables (MRT), stops IGMP operation, and stops relaying multicast forwarder events to multicast protocols.

When multicast routing is enabled, the MRIB starts processing any MRT addition/deletion requests, and any multicast forwarding events.

You must enable multicast routing before issuing other multicast commands.

Example `awplus# configure terminal`
`awplus(config)# ip multicast-routing`

Validation **show running-config**
Commands

Command changes Version 5.4.7-1.1: VRF-lite support added for SBx8100.

Version 5.4.8-1.1: VRF-lite support added for x930, SBx908 GEN2.

ipv6 mroute

Overview Use this command to inform multicast of the RPF (Reverse Path Forwarding) route to a given IPv6 multicast source.

Use the **no** variant of this command to delete a route to an IPv6 multicast source.

Syntax `ipv6 mroute <ipv6-source-address/mask-length> [<rpf-interface>]
[<rpf-address>] [rip|static] [<admin-distance>]`
`no ipv6 mroute <ipv6-source-address/mask-length> [rip|static]`

Parameter	Description
<code><ipv6-source-address/mask-length></code>	A multicast source IPv6 address and mask length, in hexadecimal notation in the format X.X::X.X/M.
<code>rip</code>	RIPng IPv6 unicast routing protocol.
<code>static</code>	Specifies a static route.
<code><rpf-interface></code>	The RPF interface or the pseudo-interface null .
<code><rpf-address></code>	X.X::X:X The closest known address on the IPv6 multicast route back to the specified source. This host IPv6 address can be within a directly connected subnet or within a remote subnet. In the case that the address is in a remote subnet, a lookup is done from the unicast route table to find the nexthop address on the path to this host.
<code><admin-distance></code>	The administrative distance. Use this to determine whether the RPF lookup selects the unicast or multicast route. Lower distances have preference. If the multicast static route has the same distance as the other RPF sources, the multicast static route takes precedence. The default is 0 and the range available is 0-255.

Mode Global Configuration

Usage notes Typically, when a Layer 3 multicast routing protocol is determining the RPF (Reverse Path Forwarding) interface for the path to a multicast source, it uses the unicast IPv6 route table to find the best path to the source. However, in some networks a deliberate choice is made to send multicast via different paths to those used for unicast. In this case, the interface via which a multicast stream from a given source enters a router may not be the same as the interface that connects to the best unicast route to that source.

This command enables the user to statically configure the switch with “multicast routes” back to given sources. When performing the RPF check on a stream from a given IPv6 source, the multicast routing protocol will look at these static entries as well as looking into the unicast routing table. The route with the lowest administrative distance - whether a static “multicast route” or a route from the unicast route table - will be chosen as the RPF route to the source.

Note that in this context the term “multicast route” does not imply a route via which the current router will forward multicast; instead it refers to the route the multicast will have traversed in order to arrive at the current router.

Examples The following example creates a static multicast route back to the sources in the 2001::1/64 subnet. The multicast route is via the host 2002::2, and has an administrative distance of 2:

```
awplus# configure terminal
awplus(config)# ipv6 mroute 2001::1/64 static 2 2002::2
```

The following example creates a static multicast route back to the sources in the 2002::2/64 subnet. The multicast route is via the host 2001::1. The administrative distance on this route has the default value of 0:

```
awplus# configure terminal
awplus(config)# ipv6 mroute 2002::2/64 2001::1
```

Validation **clear ipv6 mroute**
Commands **show ipv6 mroute**
show ipv6 mroute

ipv6 multicast route

Overview Use this command to add an IPv6 static multicast route for a specific multicast source and group IPv6 address to the multicast Routing Information Base (RIB). This IPv6 multicast route is used to forward IPv6 multicast traffic from a specific source and group ingressing on an upstream interface to a single or range of downstream interfaces.

See detailed usage notes below to configure static multicast router ports when using static IPv6 multicast routes with EPSR, and the destination VLAN is an EPSR data VLAN.

Use the **no** variant of this command to either remove an IPv6 static multicast route set with this command or to remove a specific downstream interface from an IPv6 static multicast route for a specific IPv6 multicast source and group address.

Syntax `ipv6 multicast route <ipv6-source-addr> <ipv6-group-addr> <upstream-interface> [<downstream-interface>]`
`no ipv6 multicast route <ipv6-source-addr> <ipv6-group-addr> [<upstream-interface> <downstream-interface>]`

Parameter	Description
<code><ipv6-source-addr></code>	Source IPv6 address, in dotted decimal notation in the format X.X::X.X.
<code><ipv6-group-addr></code>	Group IP address, in dotted decimal notation in the format X.X::X.X.
<code><upstream-interface></code>	Upstream interface on which the multicast packets ingress.
<code><downstream-interface></code>	Downstream interface or range of interfaces to which the multicast packets are sent.

Default By default, no static routes exist.

Mode Global Configuration

Usage notes Only one multicast route entry per IPv6 address and multicast group can be specified. Therefore, if one entry for an IPv6 static multicast route is configured, PIM will not be able to update this multicast route in any way.

If a dynamic multicast route exists, you cannot create a static multicast route with the same source IPv6 address and group IPv6 address. An error message is displayed and logged. To add a new static multicast route, either wait for the dynamic multicast route to time out or clear the dynamic multicast route with the **clear ipv6 mroute** command.

To update an existing IPv6 static multicast route entry with new or additional downstream interfaces, you must first remove the existing static multicast route and then add the new static multicast route with all downstream interfaces specified. If you attempt to update an existing static multicast route entry with an additional interface or interfaces an error message is displayed and logged.

To create a blackhole or null route where packets from a specified source and group address coming from an upstream interface are dropped rather than forwarded, do not specify the optional *<downstream-interface>* parameter when entering this command.

To remove a specific downstream interface from an existing static multicast route entry, specify the interface you want to remove with the *<downstream-interface>* parameter when entering the **no** variant of this command.

Note that if static IPv6 multicast routing is being used with EPSR and the destination VLAN is an EPSR data VLAN, then multicast router (mrouter) ports must be statically configured. This minimizes disruption for multicast traffic in the event of ring failure or restoration.

When configuring the EPSR data VLAN, statically configure mrouter ports so that the multicast router can be reached in either direction around the EPSR ring.

For example, if port1.0.1 and port1.0.8 are ports on an EPSR data VLAN vlan101, which is the destination for a static IPv6 multicast route, then configure both ports as multicast router (mrouter) ports as shown in the example commands listed below:

```
awplus>enable
awplus#configure terminal
awplus(config)#interface vlan101
awplus(config-if)#ipv6 mld snooping mrouter interface port1.0.1
awplus(config-if)#ipv6 mld snooping mrouter interface port1.0.8
```

See **ipv6 mld snooping mrouter** for a command description and command examples.

Examples To create an IPv6 static multicast route for the multicast source IPv6 address 2001::1 and group IPv6 address ff08::1, specifying the upstream VLAN interface as vlan10 and the downstream VLAN interface as vlan20, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 multicast route 2001::1 ff08::1 vlan10
vlan20
```

To create a blackhole route for the IPv6 multicast source IP address 2001::1 and group IP address ff08::1, specifying the upstream VLAN interface as vlan10, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 multicast route 2001::1 ff08::1 vlan10
```

To create an IPv6 static multicast route for the multicast source IPv6 address 2001::1 and group IPv6 address ff08::1, specifying the upstream VLAN interface as vlan10 and the downstream VLAN range as vlan20-25, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 multicast route 2001::1 ff08::1 vlan10
vlan20-25
```

To remove the downstream VLAN 23 from the IPv6 static multicast route created with the above command, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 multicast route 2001::1 ff08::1 vlan10
vlan23
```

To delete an IPv6 static multicast route for the multicast source IPv6 address 2001::1 and group IPv6 address ff08::1, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 multicast route 2001::1 ff08::1
```

Related commands [clear ipv6 mroute](#)
[ipv6 mld snooping mrouter](#)

ipv6 multicast route-limit

Overview Use this command to limit the number of multicast routes that can be added to an IPv6 multicast routing table.

Use the **no** variant of this command to return the IPv6 route limit to the default.

Syntax `ipv6 multicast route-limit <limit> [<threshold>]`
`no ipv6 multicast route-limit`

Parameter	Description
<limit>	<1-2147483647> Number of routes.
<threshold>	<1-2147483647> Threshold above which to generate a warning message. The mroute warning threshold must not exceed the mroute limit.

Default The default limit and threshold value is 2147483647.

Mode Global Configuration

Usage notes This command limits the number of multicast IPv6 routes (mroutes) that can be added to a router, and generates an error message when the limit is exceeded. If the threshold parameter is set, a threshold warning message is generated when this threshold is exceeded, and the message continues to occur until the number of mroutes reaches the limit set by the limit argument.

Examples To change the limit to 34 routes and the warning threshold to 24 routes, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 multicast route-limit 34 24
```

To return to the default limits, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 multicast route-limit
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 multicast-routing

Overview Use this command to turn on/off IPv6 multicast routing on the router; when turned off the device does not perform multicast functions.

Use the **no** variant of this command to disable IPv6 multicast routing after enabling it. Note the default stated below.

Syntax `ipv6 multicast-routing`
`no ipv6 multicast-routing`

Default Off

Mode Global Configuration

Usage When the **no** variant of this command is used, the Multicast Routing Information Base (MRIB) cleans up Multicast Routing Tables (MRT), and stops relaying multicast forwarder events to multicast protocols.

When multicast routing is enabled, the MRIB starts processing any MRT addition/deletion requests, and any multicast forwarding events.

You must enable multicast routing before issuing other multicast commands.

Examples To enable multicast routing, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 multicast-routing
```

To disable multicast routing again, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 multicast-routing
```

Validation **show running-config**
Commands

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

multicast

Overview Use this command to enable a device port to route multicast packets that ingress the port.

Use the **no** variant of this command to stop the device port from routing multicast packets that ingress the port. Note that this does not affect Layer 2 forwarding of multicast packets. If you enter **no multicast** on a port, multicast packets received on that port will not be forwarded to other VLANs, but ports in the same VLANs as the receiving port will still receive the multicast packets.



CAUTION: *We do not recommend disabling multicast routing in a live network. Some non-multicast protocols use multicast packets and will not function correctly if you disable it.*

Syntax multicast
no multicast

Default By default, all device ports route multicast packets.

Mode Interface Configuration

Examples To disable routing of multicast packets on a port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no multicast
```

To re-enable routing of multicast packets on a port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# multicast
```

Validation Commands **show running-config**

platform l2mc-overlap

Overview Use this command to enable checking for overlapping (shared) multicast entries, so that shared entries are not deleted if they are still in use.

An overlap exists if the resulting MAC address is the same for two different multicast groups. For example, 224.1.1.1 and 239.1.1.1 will result in a multicast overlap—packets destined for 239.1.1.1 will also be sent to 224.1.1.1.

Use the **no** version of this command to disable checking for overlapping entries before deletion.

Syntax platform l2mc-overlap
no platform l2mc-overlap

Mode Global Configuration

Default Enabled

Usage notes When overlap handling is on, group entries will not be deleted if a multicast overlap exists. However, this may have the unexpected behavior of flooding multicast packets to ports which have not joined the group. If this is an issue, either turn off the command or redesign the network to ensure no multicast groups overlap.

Example To prevent the deletion of overlapping (shared) Layer 2 multicast entries, use the command:

```
awplus# configure terminal
awplus(config)# platform l2mc-overlap
```

Related commands [show platform](#)

Command changes Version 5.5.1-0.1: Default changed to enabled

Version 5.5.1-1.2: Command added to SBx908 GEN2 and x950 Series. Note that it is disabled by default on these switches.

platform l2mc-table mode

Overview Use this command to control the way in which hardware Layer 2 multicast forwarding entries are allocated to multicast groups. You can choose either to share entries between groups when possible, or to allocate one entry per multicast group. Sharing entries minimizes how many hardware entries are used for Layer 2 multicast forwarding.

Use the **no** variant of this command to return to the default, which is **compact**.

Syntax platform l2mc-table mode {compact|entry-per-group}
no platform l2mc-table mode

Parameter	Description
compact	Share hardware entries across similar groups
entry-per-group	Allocate a distinct entry to each group

Default Compact

Mode Global Configuration

Usage notes This command controls the way in which hardware Layer 2 multicast forwarding entries are allocated to multicast groups. These hardware entries represent a set of ports in a VLAN, to which a multicast group is being sent. More than one multicast group may be sent to the same set of egress ports in a given VLAN at the same time. If this is the case, then the default behavior is to create just the one hardware forwarding entry representing that set of egress ports on that VLAN, and have multiple multicast groups share that one entry.

The entry-per-group option changes this behavior, so that each multicast group has its own hardware entry representing the egress ports to which it is being forwarded on a given VLAN. With this option, if multiple groups are being forwarded to the same set of ports on a particular VLAN, each group will have its own hardware entry, each comprising that same set of ports.

The default mode (compact) is usually well suited to a core switch, which is forwarding many groups to a relatively few ports, and not often changing which groups are sent to which ports. Because the usage of hardware entries is minimized, this maximizes the number of multicast groups that the switch can forward. However, sometimes the entry-per-group mode is preferable, especially in the following situations:

- If multicast data is being forwarded out through an aggregated link.

The hardware forwarding entries do not allocate data to aggregated links as such; they just work with sets of individual ports, and cannot include aggregations in their set of egress ports. If groups are being forwarded to an aggregated link, a given forwarding entry will include just one port of that aggregation. If multiple multicast groups share the same forwarding entry, they will all be sent down the same single link in the aggregation. The multicast data will not be shared across the aggregated links, and therefore the bandwidth of the aggregation will not be fully utilized.

If you change the mode to entry-per-group, then each group will have its own forwarding entry, and a statistical process will put different members of the aggregation into different forwarding entries. Therefore, the multicast data will be statistically distributed across the links in the aggregation.

- If the switch is forwarding a large number of groups to a large number of ports in a dynamic environment, where end hosts are frequently joining and leaving groups.

In compact mode, every time a group membership changes, the switch needs to check to see if the mapping of groups to forwarding entries is still optimized. If not, then it needs to rearrange the mapping, to return to an optimized state. In a highly dynamic environment, this activity adds significant processing overhead, and can lead to some disruption of multicast forwarding if hardware entries are being frequently updated. In this case, changing to entry-per-group mode removes the need to perform frequent re-optimizations, thereby reducing processing overhead, and avoiding such frequent updating of hardware entries.

Example To change to entry-per-group mode, use the commands:

```
awplus# configure terminal
awplus(config)# platform l2mc-table mode entry-per-group
```

platform multicast-ratelimit

Overview Use this command to set the maximum number of multicast packets to be forwarded to the CPU (in packets per second). Setting the value to zero disables rate limiting.

This command should be used with care. Increasing or removing the limit could make the device less responsive under heavy multicast load.

Use the **no** variant of this command to return the limit to its default.

Syntax platform multicast-ratelimit <0-1000>
no platform multicast-ratelimit

Default 10 packets per second (pps)

Mode Global Configuration

Usage notes If you find that the CPU load on your device from multicast traffic is higher than desired, reducing this rate may reduce the CPU load.

If you need the device to process a large amount of multicast traffic, increasing this rate may improve performance.

Example To set the rate to 30pps, use the commands:
awplus# configure terminal
awplus(config)# platform multicast-ratelimit 30

Command changes Version 5.4.8-1.1: default changed to 100pps on SBx908 GEN2, SBx8100, and x930 Series switches.

platform stop-unreg-mc-flooding

Overview If a multicast stream is arriving at a network device, and that network device has received no IGMP reports that request the receipt of the stream, then that stream is referred to as "unregistered". IGMP snooping actively prevents the flooding of unregistered streams to all ports in the VLAN on which the stream is received. However, there are brief moments at which this prevention is not in operation, and an unregistered stream may be briefly flooded. This command stops this flooding during even those brief periods when IGMP snooping is not explicitly preventing the flooding.

Use the **no** variant of this command to revert to default behavior and disable this feature.

NOTE: *This command should not be used within any IPv6 networks. IPv6 neighbor discovery operation is inhibited by this feature.*

This command does not affect the flooding of Local Network Control Block IPv4 multicast packets in the address range 224.0.0.1 to 224.0.0.255 (224.0.0/24). Such packets will continue to be uninterruptedly flooded, as they need to be.

Syntax platform stop-unreg-mc-flooding
no platform stop-unreg-mc-flooding

Default This feature is disabled by default.

Mode Global Configuration

Usage notes This command stops the periodic flooding of unknown or unregistered multicast packets when the Group Membership interval timer expires and there are no subscribers to a multicast group. If there is multicast traffic in a VLAN without subscribers, multicast traffic temporarily floods out of the VLAN when the Group Membership interval timer expires, which happens when the switch does not get replies from Group Membership queries.

This command also stops the initial flood of multicast packets that happens when a new multicast source starts to send traffic. This flooding lasts until snooping realises that this the multicast group is arriving at the switch, and puts an entry into hardware to prevent it from being flooded.

This command is useful in networks where low-performance devices are attached. The operation of such devices can be impaired by them receiving unnecessary streams of traffic. For example, in sites where IP cameras are in use, the flooding of video streams to a whole VLAN can send enough traffic to the cameras to cause interruption of their video streaming.

Do not use this command in IPv6 networks. The following console message is displayed after entering this command to warn you of this:

```
% WARNING: IPv6 will not work with this setting enabled
% Please consult the documentation for more information
```

Examples To enable this feature and stop multicast packet flooding, use the following commands:

```
awplus# configure terminal
awplus(config)# platform stop-unreg-mc-flooding
```

To disable this feature and allow multicast packet flooding, use the following commands:

```
awplus# configure terminal
awplus(config)# no platform stop-unreg-mc-flooding
```

Related commands [show platform](#)
[show running-config](#)

show debugging nsm mcast

Overview Use this command to show the status of the NSM multicast debugging.

Syntax show debugging nsm mcast

Mode Privileged Exec

Usage notes This command is intended for use by Allied Telesis authorized service personnel for diagnostic purposes.

Example To show debugging for NSM multicast, use the following command:
awplus# show debug nsm mcast

Output The following shows typical output.

Example output from show debug nsm mcast

```
awplus# show debugging nsm mcast
Debugging status:
  NSM multicast vif debugging is on
  NSM multicast route debugging is on
  NSM multicast route statistics debugging is on
  NSM multicast FIB message debugging is on
  NSM multicast PIM Register message debugging is on
  NSM multicast traceroute debugging is on
  NSM multicast traceroute detailed debugging is on
```

Related commands [debug nsm mcast](#)

Command changes Version 5.4.7-2.1: command added
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2

show ip mroute

Overview Use this command to display the contents of the IPv4 multicast routing (mroute) table.

Syntax `show ip mroute [<ipv4-group-addr>] [<ipv4-source-addr>] [dense|sparse|static] [count|summary]`

Parameter	Description
<ipv4-group-addr>	Group IPv4 address, in dotted decimal notation in the format A.B.C.D.
<ipv4-source-addr>	Source IPv4 address, in dotted decimal notation in the format A.B.C.D.
dense	Display dense IPv4 multicast routes.
sparse	Display sparse IPv4 multicast routes.
static	Display static IPv4 multicast routes.
count	Display the route and packet count from the IPv4 multicast routing (mroute) table.
summary	Display the contents of the IPv4 multicast routing (mroute) table in an abbreviated form.

Mode User Exec and Privileged Exec

Examples `awplus# show ip mroute 10.10.3.34 224.1.4.3`
`awplus# show ip mroute 10.10.5.24 225.2.2.2 count`
`awplus# show ip mroute 10.10.1.34 summary`

Output The following is a sample output of this command displaying the IPv4 multicast routing table, with and without specifying the group and source IPv4 address:

Example output from the show ip mroute command

```
awplus# show ip mroute
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)

(10.10.1.52, 224.0.1.3), uptime 00:00:31, stat expires 00:02:59
Owner PIM-SM, Flags: TF
  Incoming interface: vlan2
  Outgoing interface list:
    vlan3 (1)
```

Example output from the show ip mroute command with the source and group IPv4 address specified

```
awplus# show ip mroute 10.10.1.52 224.0.1.3

IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)

(10.10.1.52, 224.0.1.3), uptime 00:03:24, stat expires 00:01:28
Owner PIM-SM, Flags: TF
  Incoming interface: vlan2
  Outgoing interface list:
    vlan3 (1)
```

The following is a sample output of this command displaying the packet count from the IPv4 multicast routing table:

Example output from the show ip mroute count command

```
awplus# show ip mroute count
IP Multicast Statistics
Total 1 routes using 132 bytes memory
Route limit/Route threshold: 2147483647/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT rcv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK rcv/Reg NACK rcv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10

Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If
pkts
Fwd msg counts: WRONGVIF/WHOLEPKT rcv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat sent
Reg pkt counts: Reg ACK rcv/Reg NACK rcv/Reg pkt sent

(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
  Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0
```

The following is a sample output for this command displaying the IPv4 multicast routing table in an abbreviated form:

Example output from the show ip mroute summary command

```
awplus# show ip mroute summary

IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)

(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM, Flags: TF
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip mvif

Overview Use this command to display the contents of the IPv4 Multicast Routing Information Base (MRIB) VIF table.

Syntax `show ip mvif <interface>`

Parameter	Description
<interface>	The interface to display information about.

Mode User Exec and Privileged Exec

Example `awplus# show ip mvif vlan2`

Output The following shows typical output.

Example output from the show ip mvif command

Interface	Vif Idx	Owner Module	TTL	Local Address	Remote Address	Uptime
vlan2	0	PIM-SM	1	192.168.1.53	0.0.0.0	00:04:26
Register	1		1	192.168.1.53	0.0.0.0	00:04:26
vlan3	2	PIM-SM	1	192.168.10.53	0.0.0.0	00:04:25

Command changes Version 5.4.7-1.1: VRF-lite support added for SBx8100.
Version 5.4.8-1.1: VRF-lite support added for x930, SBx908 GEN2.

show ip rpf

Overview Use this command to display Reverse Path Forwarding (RPF) information for the specified IPv4 source address.

Syntax `show ip rpf <source-addr>`

Parameter	Description
<code><source-addr></code>	Source IPv4 address, in dotted decimal notation in the format A.B.C.D.

Mode User Exec and Privileged Exec

Example `awplus# show ip rpf 10.10.10.50`

Command changes Version 5.4.7-1.1: VRF-lite support added for SBx8100.
Version 5.4.8-1.1: VRF-lite support added for x930, SBx908 GEN2.

show ipv6 mif

Overview Use this command to display the contents of the IPv6 Multicast Routing Information Base (MRIB) MIF table.

Syntax show ipv6 mif [<interface>]

Parameter	Description
<interface>	An interface to display information about.

Mode User Exec and Privileged Exec

Example To display the contents of the MIF table for all interfaces, use the following command:

```
awplus# show ipv6 mif
```

To display the contents of the MIF table for a specific interface, use the following command:

```
awplus# show ipv6 mif vlan2
```

Output The following shows typical output.

Example output from the show ipv6 mif command

awplus#show ipv6 mif					
Interface	Mif Idx	Owner Module	Uptime		
vlan3	0	MLD/MLD Proxy-Service	03:28:48		
vlan2	1	MLD/MLD Proxy-Service	03:28:48		
vlan1	2	MLD/MLD Proxy-Service	03:28:48		

Example output from the show ipv6 mif command with the interface parameter specified

Interface	Mif Idx	Owner Module	TTL	Remote Address	Uptime
vlan2	0	MLD/MLD Proxy-Service	1	0.0.0.0	00:05:17

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 mroute

Overview Use this command to display the contents of the IPv6 multicast routing (mroute) table.

Syntax `show ipv6 mroute [<ipv6-group-addr>] [<ipv6-source-addr>]
[{count|summary}]`

Parameter	Description
<code><ipv6-group-addr></code>	Group IPv6 address, in hexadecimal notation in the format X.X::X.X.
<code><ipv6-source-addr></code>	Source IPv6 address, in hexadecimal notation in the format X.X::X.X.
<code>count</code>	Display the route and packet count from the IPv6 multicast routing (mroute) table.
<code>summary</code>	Display the contents of the IPv6 multicast routing (mroute) table in an abbreviated form.

Mode User Exec and Privileged Exec

Examples

```
awplus# show ipv6 mroute
awplus# show ipv6 mroute count
awplus# show ipv6 mroute summary
awplus# show ipv6 mroute 2001::2 ff08::1 count
awplus# show ipv6 mroute 2001::2 ff08::1
awplus# show ipv6 mroute 2001::2 summary
```

Output The following is a sample output of this command displaying the IPv6 multicast routing table for a single static IPv6 Multicast route:

Example output from the show ipv6 mroute command

```
awplus#show ipv6 mroute
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface
(2001::2, ff08::1), uptime 03:18:38
Owner IMI, Flags: F
  Incoming interface: vlan2
  Outgoing interface list:
    vlan3
```

The following is a sample output of this command displaying the IPv6 multicast routing count table for a single static IPv6 Multicast route:

Example output from the show ipv6 mroute count command

```
awplus#show ipv6 mroute count

IPv6 Multicast Statistics
Total 1 routes using 152 bytes memory
Route limit/Route threshold: 1024/1024
Total NOCACHE/WRONGmif/WHOLEPKT rcv from fwd: 6/0/0
Total NOCACHE/WRONGmif/WHOLEPKT sent to clients: 6/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK rcv/Reg NACK rcv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:14

Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If
pkts
Fwd msg counts: WRONGmif/WHOLEPKT rcv
Client msg counts: WRONGmif/WHOLEPKT/Imm Stat/Timed Stat sent
Reg pkt counts: Reg ACK rcv/Reg NACK rcv/Reg pkt sent

(2001::2, ff08::1), Forwarding: 0/0, Other: 0
  Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0
```

The following is a sample output of this command displaying the IPv6 multicast routing summary table for a single static IPv6 Multicast route:

Example output from the show ipv6 mroute summary command

```
awplus#show ipv6 mroute summary
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface

(2001::2, ff08::1), 03:20:28/-, IMI, Flags: F
```

show ipv6 multicast forwarding

Overview Use this command to view the status of multicast forwarding.

Syntax show ipv6 multicast forwarding

Mode Privileged Exec

Example To show the status of the multicast forwarding, use the following command:

```
awplus# show ipv6 multicast forwarding
```

Output The following shows typical output.

Example output from the show ipv6 multicast forwarding command:

```
ipv6 multicast forwarding is disabled
```

Related commands [ipv6 multicast forward-slow-path-packet](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

33

PIM-SM Commands

- Contents**
- **Introduction** on page 1594
 - **clear ip pim sparse-mode bsr rp-set *** on page 1595
 - **clear ip pim sparse-mode packet statistics** on page 1596
 - **clear ip mroute pim sparse-mode** on page 1597
 - **debug pim sparse-mode** on page 1598
 - **debug pim sparse-mode timer** on page 1599
 - **ip multicast allow-register-fragments** on page 1601
 - **ip pim accept-register list** on page 1602
 - **ip pim anycast-rp** on page 1603
 - **ip pim bsr-border** on page 1604
 - **ip pim bsr-candidate** on page 1605
 - **ip pim cisco-register-checksum** on page 1606
 - **ip pim cisco-register-checksum group-list** on page 1607
 - **ip pim crp-cisco-prefix** on page 1608
 - **ip pim dr-priority** on page 1609
 - **ip pim exclude-genid** on page 1610
 - **ip pim ext-srcs-directly-connected** on page 1611
 - **ip pim hello-holdtime (PIM-SM)** on page 1612
 - **ip pim hello-interval (PIM-SM)** on page 1613
 - **ip pim ignore-rp-set-priority** on page 1614
 - **ip pim jp-timer** on page 1615
 - **ip pim neighbor-filter (PIM-SM)** on page 1616
 - **ip pim register-rate-limit** on page 1617
 - **ip pim register-rp-reachability** on page 1618
 - **ip pim register-source** on page 1619
 - **ip pim register-suppression** on page 1620
 - **ip pim rp-address** on page 1621
 - **ip pim rp-candidate** on page 1623
 - **ip pim rp-register-kat** on page 1625
 - **ip pim sparse-mode** on page 1626
 - **ip pim sparse-mode join-prune-batching** on page 1627
 - **ip pim sparse-mode passive** on page 1628
 - **ip pim sparse-mode wrong-vif-suppression** on page 1629
 - **ip pim spt-threshold** on page 1630
 - **ip pim spt-threshold group-list** on page 1631
 - **ip pim ssm** on page 1632
 - **service pim** on page 1634

- **show debugging pim sparse-mode** on page 1635
- **show ip pim sparse-mode bsr-router** on page 1636
- **show ip pim sparse-mode interface** on page 1637
- **show ip pim sparse-mode interface detail** on page 1639
- **show ip pim sparse-mode local-members** on page 1640
- **show ip pim sparse-mode mroute** on page 1642
- **show ip pim sparse-mode mroute detail** on page 1644
- **show ip pim sparse-mode neighbor** on page 1646
- **show ip pim sparse-mode nexthop** on page 1648
- **show ip pim sparse-mode packet statistics** on page 1650
- **show ip pim sparse-mode rp-hash** on page 1651
- **show ip pim sparse-mode rp mapping** on page 1652
- **undebg all pim sparse-mode** on page 1653

Introduction

Overview This chapter provides an alphabetical reference of PIM-SM commands. For commands common to PIM-SM and PIM-DM, see [Multicast Commands](#).

clear ip pim sparse-mode bsr rp-set *

Overview Use this command to clear all Rendezvous Point (RP) sets learned through the PIMv2 Bootstrap Router (BSR).

Syntax clear ip pim sparse-mode bsr rp-set *

Parameter	Description
*	Clears all RP sets.

Mode Privileged Exec

Usage notes For multicast clients, note that one router will be automatically or statically designated as the RP, and all routers must explicitly join through the RP. A Designated Router (DR) sends periodic Join/Prune messages toward a group-specific RP for each group that it has active members.

For multicast sources, note that the Designated Router (DR) unicasts Register messages to the RP encapsulating the data packets from the multicast source. The RP forwards decapsulated data packets toward group members.

Example awplus# clear ip pim sparse-mode bsr rp-set *

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

clear ip pim sparse-mode packet statistics

Overview Use this command to clear the PIM sparse mode packet statistics counter.

Syntax clear ip pim sparse-mode packet statistics

Mode Privileged Exec

Example The following command clears the current packet receive counts for PIM sparse-mode:

```
awplus# configure terminal
awplus(config)# clear ip pim sparse-mode statistics
```

Output The following shows typical output.

Example output from clear ip pim sparse-mode statistics

```
awplus(config)#clear ip pim sparse-mode statistics
PIM-SM Receive Packet Statistics :
All PIM-SM      :   Total : 0   Valid : 0
Hello           :   Total : 0   Valid : 0
Register        :   Total : 0   Valid : 0
Register Stop   :   Total : 0   Valid : 0
Join/Prune      :   Total : 0   Valid : 0
Bootstrap       :   Total : 0   Valid : 0
Assert          :   Total : 0   Valid : 0
Candidate-RP    :   Total : 0   Valid : 0
```

Related commands [show ip pim sparse-mode packet statistics](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.

Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

clear ip mroute pim sparse-mode

Overview Use this command to clear all multicast route table entries learned through PIM-SM for a specified multicast group address, and optionally a specified multicast source address.

Syntax `clear ip mroute <Group-IP-address> pim sparse-mode`
`clear ip mroute <Group-IP-address> <Source-IP-address> pim sparse-mode`

Parameter	Description
<code><Group-IP-address></code>	Specify a multicast group IPv6 address, entered in the form A.B.C.D.
<code><Source-IP-address></code>	Specify a source group IP address, entered in the form A.B.C.D.

Mode Privileged Exec

Example `awplus# clear ip mroute pim sparse-mode 224.0.0.0`
`awplus# clear ip mroute 192.168.7.1 pim sparse-mode 224.0.0.0`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

debug pim sparse-mode

Overview Use this command to turn on some or all PIM-SM debugging.

Use the **no** variant of this command to turn off some or all PIM-SM debugging.

Syntax debug pim sparse-mode [all] [events] [mfc] [mib] [nexthop] [nsm]
[packet] [state] [mtrace]
no debug pim sparse-mode [all] [events] [mfc] [mib] [nexthop]
[nsm] [packet] [state] [mtrace]

Parameter	Description
all	Activates/deactivates all PIM-SM debugging.
events	Activates debug printing of events.
mfc	Activates debug printing of MFC (Multicast Forwarding Cache in kernel) add/delete/updates.
mib	Activates debug printing of PIM-SM MIBs.
nexthop	Activates debug printing of PIM-SM next hop communications.
nsm	Activates debugging of PIM-SM Network Services Module communications.
packet	Activates debug printing of incoming and/or outgoing packets.
state	Activates debug printing of state transition on all PIM-SM FSMs.
mtrace	Activates debug printing of multicast traceroute.

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim sparse-mode all

Related commands [show debugging pim sparse-mode](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

debug pim sparse-mode timer

Overview Use this command to enable debugging for the specified PIM-SM timers. Use the **no** variants of this command to disable debugging for the specified PIM-SM timers.

Syntax

```
debug pim sparse-mode timer assert [at]
no debug pim sparse-mode timer assert [at]
debug pim sparse-mode timer bsr [bst|crp]
no debug pim sparse-mode timer bsr [bst|crp]
debug pim sparse-mode timer hello [ht|nlt|tht]
no debug pim sparse-mode timer hello [ht|nlt|tht]
debug pim sparse-mode timer joinprune [jt|et|ppt|kat|ot]
no debug pim sparse-mode timer joinprune [jt|et|ppt|kat|ot]
debug pim sparse-mode timer register [rst]
no debug pim sparse-mode timer register [rst]
```

Parameter	Description
assert	Enable or disable debugging for the Assert timers.
at	Enable or disable debugging for the Assert Timer.
bsr	Enable or disable debugging for the specified Bootstrap Router timer, or all Bootstrap Router timers.
bst	Enable or disable debugging for the Bootstrap Router: Bootstrap Timer.
crp	Enable or disable debugging for the Bootstrap Router: Candidate-RP Timer.
hello	Enable or disable debugging for the specified Hello timer, or all Hello timers.
ht	Enable or disable debugging for the Hello timer: Hello Timer.
nlt	Enable or disable debugging for the Hello timer: Neighbor Liveness Timer.
tht	Enable or disable debugging for the Hello timer: Triggered Hello Timer.
joinprune	Enable or disable debugging for the specified JoinPrune timer, or all JoinPrune timers.

Parameter	Description
jt	Enable or disable debugging for the JoinPrune timer: upstream Join Timer.
et	Enable or disable debugging for the JoinPrune timer: Expiry Timer.
ppt	Enable or disable debugging for the JoinPrune timer: PrunePending Timer.
kat	Enable or disable debugging for the JoinPrune timer: KeepAlive Timer.
ot	Enable or disable debugging for the JoinPrune timer: Upstream Override Timer.
register	Enable or disable debugging for the Register timers.
rst	Enable or disable debugging for the Register timer: Register Stop Timer.

Default By default, all debugging is disabled.

Mode Privileged Exec and Global Configuration

Examples To enable debugging for the PIM-SM Bootstrap Router bootstrap timer, use the commands:

```
awplus(config)# debug pim sparse-mode timer bsr bst
```

To enable debugging for the PIM-SM Hello: neighbor liveness timer, use the command:

```
awplus(config)# debug pim sparse-mode timer hello ht
```

To enable debugging for the PIM-SM Joinprune expiry timer, use the command:

```
awplus# debug pim sparse-mode timer joinprune et
```

To disable debugging for the PIM-SM Register timer, use the command:

```
awplus# no debug pim sparse-mode timer register
```

Related commands [show debugging pim sparse-mode](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip multicast allow-register-fragments

Overview Use this command to allow PIM to register fragmented packets. It is disabled by default.

Use the **no** variant of this command to stop PIM from registering fragmented packets.

Syntax `ip multicast allow-register-fragments`
`no ip multicast allow-register-fragments`

Default This command is disabled by default

Mode Global Configuration

Usage notes Most multicast streams are not fragmented, and therefore this command is unnecessary. By default, when IP multicast packets are fragmented, the switch attempts to reassemble them before registering the packets. This is necessary for tasks such as network address translation, or a firewall.

However, reassembly may be difficult for switches where the CPU cannot handle a large amount of traffic. In that situation, with the CPU failing to reassemble the fragmented packets, there can be a delay in forwarding multicast streams.

We do not recommend enabling this feature if a firewall or network address translation is being used. This feature should only be enabled if multicast data is fragmented and the data rate is too high for the CPU to manage reassembly.

Example To allow PIM to register fragmented packets, use the commands:

```
awplus# configure terminal
awplus(config)# ip multicast allow-register-fragments
```

ip pim accept-register list

Overview Use this command to configure the ability to filter out multicast sources specified by the given access-list at the Rendezvous Point (RP), so that the RP will accept/refuse to perform the register mechanism for the packets sent by the specified sources.

Use the **no** variant of this command to revert to default.

Syntax `ip pim accept-register list {<100-199>|<2000-2699>|<name>}
no ip pim accept-register`

Parameter	Description
<100-199>	IP extended access-list, identified by number.
<2000-2699>	IP extended access list, identified by number (expanded range).
<name>	IP access list, identified by name.

Default By default, the RP accepts register packets from all multicast sources.

Mode Global Configuration

Example To create an ACL that denies packets from 100.1.1.1 to any destination, and use that ACL to filter at the RP point, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 121
awplus(config-ip-ext-acl)# deny ip 100.1.1.1 0.0.0.0 any
awplus(config-ip-ext-acl)# exit
awplus(config)# ip pim accept-register list 121
```

ip pim anycast-rp

Overview Use this command to configure Anycast RP (Rendezvous Point) in a RP set. Use the **no** variant of this command to remove the configuration.

Syntax `ip pim anycast-rp <anycast-rp-address> <member-rp-address>`
`no ip pim anycast-rp <anycast-rp-address> [<member-rp-address>]`

Parameter	Description
<code><anycast-rp-address></code>	<A.B.C.D> Specify an anycast IP address to configure an Anycast RP (Rendezvous Point) in a RP set.
<code><member-rp-address></code>	<A.B.C.D> Specify an Anycast RP (Rendezvous Point) address to configure an Anycast RP in a RP set.

Mode Global Configuration

Usage notes Anycast is a network addressing and routing scheme where data is routed to the nearest or best destination as viewed by the routing topology. Compared to unicast with a one-to-one association between network address and network endpoint, and multicast with a one-to-many association between network address and network endpoint; anycast has a one-to-many association between network address and network endpoint. For anycast, each destination address identifies a set of receiver endpoints, from which only one receiver endpoint is chosen.

Use this command to specify the Anycast RP configuration in the Anycast RP set. Use the **no** variant of this command to remove the Anycast RP configuration. Note that the member RP address is optional when using the **no** parameter to remove the Anycast RP configuration. removing the anycast RP address also removes the member RP address.

Examples The following example shows how to configure the Anycast RP address with **ip pim anycast-rp**:

```
awplus# configure terminal
awplus(config)# ip pim anycast-rp 1.1.1.1 10.10.10.10
```

The following example shows how to remove the Anycast RP in the RP set specifying only the anycast RP address with **no ip pim anycast-rp**, but not specifying the member RP address:

```
awplus# configure terminal
awplus(config)# no ip pim anycast-rp 1.1.1.1
```

ip pim bsr-border

Overview Use the **ip pim bsr-border** command to prevent Bootstrap Router (BSR) messages from being sent or received through an interface. The BSR border is the border of the PIM domain.

Use the **no** variant of this command to disable the configuration set with **ip pim bsr-border**.

Syntax `ip pim bsr-border`
`no ip pim bsr-border`

Mode Interface Configuration for a VLAN interface.

Usage notes When this command is configured on an interface, no PIM version 2 BSR messages will be sent or received through the interface. Configure an interface bordering another PIM domain with this command to avoid BSR messages from being exchanged between the two PIM domains.

BSR messages should not be exchanged between different domains, because devices in one domain may elect Rendezvous Points (RPs) in the other domain, resulting in loss of isolation between the two PIM domains that would stop the PIM protocol from working as intended.

Examples The following example configures the VLAN interface vlan2 to be the PIM domain border:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim bsr-border
```

The following example removes the VLAN interface vlan2 from the PIM domain border:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim bsr-border
```


ip pim bsr-candidate

Overview Use this command to give the device the candidate BSR (Bootstrap Router) status using the specified IP address mask of the interface.

Use the **no** variant of this command to withdraw the address of the interface from being offered as a BSR candidate.

Syntax `ip pim bsr-candidate <interface> [<hash>] [<priority>]`
`no ip pim bsr-candidate [<interface>]`

Parameter	Description
<interface>	The interface.
<hash>	<0-32> configure hash mask length for RP selection. The default hash value if you do not configure this parameter is 10.
<priority>	<0-255> configure priority for a BSR candidate. Note that you must also specify the <hash> (mask length) when specifying the <priority>. The default priority if you do not configure this parameter is 64.

Mode Global Configuration

Default The default hash parameter value is 10 and the default priority parameter value is 64.

Examples To set the BSR candidate to the VLAN interface vlan2, with the optional mask length and BSR priority parameters, enter the commands shown below:

```
awplus# configure terminal
awplus(config)# ip pim bsr-candidate vlan2 20 30
```

To withdraw the address of vlan2 from being offered as a BSR candidate, enter:

```
awplus# configure terminal
awplus(config)# no ip pim bsr-candidate vlan2
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim cisco-register-checksum

Overview Use this command to configure the option to calculate the Register checksum over the whole packet. This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to disable this option.

Syntax ip pim cisco-register-checksum
no ip pim cisco-register-checksum

Default This command is disabled by default. By default, Register Checksum is calculated only over the header.

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# ip pim cisco-register-checksum

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim cisco-register-checksum group-list

Overview Use this command to configure the option to calculate the Register checksum over the whole packet on multicast groups specified by the access-list. This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to revert to default settings.

Syntax `ip pim cisco-register-checksum group-list <acl>`
`no ip pim cisco-register-checksum group-list <acl>`

Parameter	Description
<acl>	The standard, expanded or named ACL to use.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim cisco-register-checksum group-list 34`
`awplus(config)# access-list 34 permit 224.0.1.3`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim crp-cisco-prefix

Overview Use this command to interoperate with Cisco devices that conform to an earlier draft standard. Some Cisco devices might not accept candidate RPs with a group prefix number of zero. Note that the latest BSR specification prohibits sending RP advertisements with prefix 0. RP advertisements for the default IPv4 multicast group range 224/4 are sent with a prefix of 1.

Use the **no** variant of this command to revert to the default settings.

Syntax ip pim crp-cisco-prefix
no ip pim crp-cisco-prefix

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# ip pim crp-cisco-prefix
awplus# configure terminal
awplus(config)# no ip pim crp-cisco-prefix

Related commands [ip pim rp-candidate](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim dr-priority

Overview Use this command to set the Designated Router priority value.
Use the **no** variant of this command to disable this function.

Syntax `ip pim dr-priority <priority>`
`no ip pim dr-priority [<priority>]`

Parameter	Description
<priority>	Specify the Designated Router priority value, in the range 0 to 4294967294. Note that a higher value has a higher preference or higher priority.

Default The default is 1. The negated form of this command restores the value to the default.

Mode Interface Configuration for a VLAN interface.

Examples To set the Designated Router priority value to 11234 for the VLAN interface vlan2, apply the commands as shown below:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim dr-priority 11234
```

To disable the Designated Router priority value for the VLAN interface vlan2, apply the commands as shown below:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim dr-priority
```

Related commands [ip pim ignore-rp-set-priority](#)

ip pim exclude-genid

Overview Use this command to exclude the GenID option from Hello packets sent out by the PIM module on a particular interface. This command is used to interoperate with older Cisco IOS versions.

Use the **no** variant of this command to revert to default settings.

Syntax ip pim exclude-genid
no ip pim exclude-genid

Default By default, this command is disabled; the GenID option is included.

Mode Interface Configuration for a VLAN interface.

Example To exclude the GenID option on interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim exclude-genid
```

ip pim ext-srcs-directly-connected

Overview Use this command to configure PIM to treat all source traffic arriving on the interface as though it was sent from a host directly connected to the interface.

Use the **no** variant of this command to configure PIM to treat only directly connected sources as directly connected.

Syntax `ip pim ext-srcs-directly-connected`
`no ip pim ext-srcs-directly-connected`

Default The **no** variant of this command is the default behavior.

Mode Interface Configuration for a VLAN interface.

Example To configure PIM to treat all sources as directly connected for VLAN interface `vlan2`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim ext-srcs-directly-connected
```

To configure PIM to treat only directly connected sources as directly connected for VLAN interface `vlan2`, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim ext-srcs-directly-connected
```

ip pim hello-holdtime (PIM-SM)

Overview This command configures a hello-holdtime value. You cannot configure a hello-holdtime value that is less than the current hello-interval.

Use the **no** variant of this command to return it to its default of 3.5 * the current hello-interval.

Syntax `ip pim hello-holdtime <holdtime>`
`no ip pim hello-holdtime`

Parameter	Description
<holdtime>	<1-65535> The holdtime value in seconds (no fractional seconds are accepted).

Default The default hello-holdtime value is 3.5 * the current hello-interval.

Mode Interface Configuration for a VLAN interface.

Usage Each time the hello-interval is updated, the hello-holdtime is also updated, according to the following rules:

If the hello-holdtime is not configured; or if the hello-holdtime is configured and less than the current hello-interval value, it is modified to the (3.5 * hello-interval). Otherwise, it retains the configured value.

Example To set the hello-hold time value on interface vlan2 use the commands

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim hello-holdtime 123
```


ip pim hello-interval (PIM-SM)

Overview This command configures a hello-interval value.

Use the **no** variant of this command to reset the hello-interval to the default.

Syntax `ip pim hello-interval <interval>`
`no ip pim hello-interval`

Parameter	Description
<code><interval></code>	<code><1-65535></code> The value in seconds (no fractional seconds accepted).

Default The default hello-interval value is 30 seconds.

Mode Interface Configuration for a VLAN interface.

Usage When the hello-interval is configured, and the hello-holdtime is not configured, or when the configured hello-holdtime value is less than the new hello-interval value; the holdtime value is modified to the (3.5 * hello-interval). Otherwise, the hello-holdtime value is the configured value.

Example To set the hello-interval value on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim hello-interval 123
```

ip pim ignore-rp-set-priority

Overview Use this command to ignore the RP-SET priority value, and use only the hashing mechanism for RP selection.

This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to disable this setting.

Syntax `ip pim ignore-rp-set-priority`
`no ip pim ignore-rp-set-priority`

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim ignore-rp-set-priority`

ip pim jp-timer

Overview Use this command to set the PIM-SM join/prune timer. Note that the value the device puts into the holdtime field of the join/prune packets it sends to its neighbors is 3.5 times the join/prune timer value set using this command.

Use the **no** variant of this command to return the PIM-SM join/prune timer to its default value of 60 seconds, which corresponds to a join/prune packet holdtime of 210 seconds.

Syntax `ip pim jp-timer <1-65535>`
`no ip pim jp-timer [<1-65535>]`

Parameter	Description
<1-65535>	Specifies the join/prune timer value. The default value is 60 seconds.

Default The default join/prune timer value is 60 seconds.

Mode Global Configuration

Example To set the join/prune timer value to 300 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip pim jp-timer 300
```

To return the join/prune timer to its default value of 60 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ip pim jp-timer
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim neighbor-filter (PIM-SM)

Overview This command enables filtering of neighbors on the VLAN interface. When configuring a neighbor filter, PIM-SM will either not establish adjacency with the neighbor, or terminate adjacency with the existing neighbors if denied by the filtering access list.

Use the **no** variant of this command to disable this function.

Syntax `ip pim neighbor-filter {<number>|<accesslist>}`
`no ip pim neighbor-filter {<number>|<accesslist>}`

Parameter	Description
<number>	<1-99> Standard IP access-list number.
<accesslist>	IP access list name.

Default By default, there is no filtering.

Mode Interface Configuration for a VLAN interface.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim neighbor-filter 14`

ip pim register-rate-limit

Overview Use this command to configure the rate of register packets sent by this DR, in units of packets per second.

Use the **no** variant of this command to remove the limit.

Syntax `ip pim register-rate-limit <1-65535>`
`no ip pim register-rate-limit`

Parameter	Description
<1-65535>	Specifies the maximum number of packets that can be sent per second.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim register-rate-limit 3444`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim register-rp-reachability

Overview Use this command to enable the RP reachability check for PIM Register processing at the DR. The default setting is no checking for RP-reachability.

Use the **no** variant of this command to disable this processing.

Syntax `ip pim register-rp-reachability`
`no ip pim register-rp-reachability`

Default This command is disabled; by default, there is no checking for RP-reachability.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim register-rp-reachability`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim register-source

Overview Use this command to configure the source address of register packets sent by this DR, overriding the default source address, which is the address of the RPF interface toward the source host.

Use the **no** variant of this command to un-configure the source address of Register packets sent by this DR, reverting back to use the default source address that is the address of the RPF interface toward the source host.

Syntax `ip pim register-source [<source-address>|<interface>]`
`no ip pim register-source`

Parameter	Description
<code><source-address></code>	The IP address, entered in the form A.B.C.D, to be used as the source of the register packets.
<code><interface></code>	The name of the interface to be used as the source of the register packets.

Usage notes The configured address must be a reachable address to be used by the RP to send corresponding Register-Stop messages in response. It is normally the local loopback interface address, but can also be a physical address. This address must be advertised by unicast routing protocols on the DR. The configured interface does not have to be PIM enabled.

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim register-source 10.10.1.3`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim register-suppression

Overview Use this command to configure the register-suppression time, in seconds, overriding the default of 60 seconds. Configuring this value modifies register-suppression time at the DR. Configuring this value at the RP modifies the RP-keepalive-period value if the **ip pim rp-register-kat** is not used.

Use the **no** variant of this command to reset the value to its default of 60 seconds.

Syntax `ip pim register-suppression <1-65535>`
`no ip pim register-suppression`

Mode Global Configuration

Example `awplus# configure terminal`
`awplus(config)# ip pim register-suppression 192`

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim rp-address

Overview Use this command to statically configure the RP (Rendezvous Point) address for multicast groups.

Use the **no** variant of this command to remove a statically configured RP address for multicast groups.

Syntax `ip pim rp-address <ip-address> group-list <group-prefix> [override]`
`no ip pim rp-address <ip-address> group-list <group-prefix> [override]`

Parameter	Description
<ip-address>	IP address of RP, entered in the form A . B . C . D.
<group-prefix>	Multicast group IP prefix address of RP, entered in the form A . B . C . D / M
override	Enables statically defined RPs to override dynamically learned RPs.

Mode Global Configuration

Usage notes The AlliedWare Plus PIM-SM implementation supports multiple static RPs. It also supports usage of static RP and the BSR (Bootstrap Router) mechanism simultaneously. The **ip pim rp-address** command is used to statically configure the RP address for multicast groups.

You need to understand the following information before using this command.

If the RP address configured by the BSR, and the statically configured RP address are both available for a group range, then the RP address configured through the BSR is chosen over the statically configured RP address, unless the 'override' parameter is specified, in which case, the static RP will be chosen.

After configuration, the RP address is inserted into a static RP group tree based on the configured group ranges. For each group range, multiple static RPs are maintained in a linked list. This list is sorted in a descending order of IP addresses. When selecting static RPs for a group range, the first element (which is the static RP with highest IP address) is chosen.

RP address deletion is handled by removing the static RP from all the existing group ranges and recalculating the RPs for existing TIB states if required.

NOTE: A unique RP address may only be specified once as a static RP.

Example awplus# configure terminal
awplus(config)# ip pim rp-address 192.0.2.10 group-list
233.252.0.0/24 override

```
awplus#show ip pim sp rp mapping
PIM Group-to-RP Mappings
Group(s): 233.252.0.0/24, Static
RP: 192.0.2.10
Uptime: 00:00:17
```

Related commands **ip pim rp-candidate**
ip pim rp-register-kat
show ip pim sparse-mode rp mapping

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-0.5: Replaced <acl> parameter with <group-list> parameter.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim rp-candidate

Overview Use this command to make the router an RP (Rendezvous Point) candidate, using the IP address of the specified interface.

Use the **no** variant of this command to remove the RP status set using the **ip pim rp-candidate** command.

Syntax `ip pim rp-candidate <interface> [priority <priority>] [interval <interval>] [grouplist <acl>]`
`no ip pim rp-candidate [<interface>]`

Parameter	Description
<interface>	Interface name.
priority <priority>	The RP candidate priority for this interface on this device, from 0 to 255. The lower the priority value, the more likely this candidate is to become the RP.
interval <interval>	The advertisement interval, from 1 to 16383 seconds.
grouplist <acl>	The standard, expanded or named ACL to use.

Default The priority value for a candidate RP is 192 by default until specified using the **priority** parameter.

Mode Global Configuration

Usage notes Entering the command **ip pim rp-candidate <interface>** without one of the optional **priority**, **interval**, or **grouplist** parameters will configure the candidate RP with a priority value of 192.

Examples To specify a priority of 3, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip pim rp-candidate vlan2 priority 3
```

To use the ACL numbered 3 to specify the group prefixes that are advertised in association with the RP address, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip pim rp-candidate vlan2 group-list 3
```

To stop the device from being an RP candidate on vlan2, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no ip pim rp-candidate vlan2
```

Related commands **ip pim rp-address**
ip pim rp-register-kat
ip pim crp-cisco-prefix

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim rp-register-kat

Overview Use this command to configure the Keep Alive Time (KAT) for (S,G) states at the RP (Rendezvous Point) to monitor PIM-SM Register packets.

Use the **no** variant of this command to return the PIM-SM KAT timer to its default value of 210 seconds.

Syntax ip pim rp-register-kat <1-65535>
no ip pim rp-register-kat

Parameter	Description
<1-65535>	Specify the KAT timer in seconds. The default value is 210 seconds.

Mode Global Configuration

Default The default PIM-SM KAT timer value is 210 seconds.

Examples awplus# configure terminal
awplus(config)# ip pim rp-register-kat 3454
awplus# configure terminal
awplus(config)# no ip pim rp-register-kat

Related commands [ip pim rp-address](#)
[ip pim rp-candidate](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim sparse-mode

Overview Use this command to enable PIM-SM on an interface.
Use the **no** variant of this command to disable PIM-SM on an interface.

Syntax ip pim sparse-mode
no ip pim sparse-mode

Mode Interface Configuration for a VLAN interface.

Examples To enable PIM-SM on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim sparse-mode
```

To disable PIM-SM on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim sparse-mode
```

ip pim sparse-mode join-prune-batching

Overview Use this command to enable batching of Join and Prune messages in PIM-SM. This functionality reduces the number of PIM packets that must be sent to maintain a large number of groups

Use the **no** variant of this command to disable batching of Join and Prune messages in PIM-SM.

Syntax ip pim sparse-mode join-prune-batching
no ip pim sparse-mode join-prune-batching

Default Disabled.

Mode Global Configuration

Examples To enable Join/Prune batching for PIM-SM, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip pim sparse-mode join-prune-batching
```

To disable Join/Prune batching for PIM-SM, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no ip pim sparse-mode join-prune-batching
```

Related commands [ip pim sparse-mode wrong-vif-suppression](#)

Command changes Version 5.4.8-2.3: command added.

ip pim sparse-mode passive

Overview Use this command to enable and disable passive mode operation for local members on an interface.

Use the **no** variant of this command to disable passive mode operation for local members on an interface.

Syntax ip pim sparse-mode passive
no ip pim sparse-mode passive

Mode Interface Configuration for a VLAN interface.

Usage Passive mode essentially stops PIM transactions on the interface, allowing only IGMP mechanism to be active. To turn off passive mode, use the **no ip pim sparse-mode passive** or the **ip pim sparse-mode** command. To turn off PIM activities on an interface, use the **no ip pim sparse-mode** command.

Examples To enable passive mode on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim sparse-mode passive
```

To disable passive mode on vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim sparse-mode passive
```


ip pim sparse-mode wrong-vif-suppression

Overview Use this command to permit or block multicast packets that arrive on the wrong interface.

Use the **no** variant of this command to disable wrong VIF suppression.

Syntax ip pim sparse-mode wrong-vif-suppression
no ip pim sparse-mode wrong-vif-suppression

Default Disabled.

Mode Global Configuration

Usage notes This command enables wrong VIF suppression for PIM sparse-mode. Wrong VIF suppression prevents multicast packets received on the wrong upstream interface from being copied to the CPU.

Examples To enable wrong VIF suppression, use the commands:

```
awplus# configure terminal
awplus(config)# ip pim sparse-mode wrong-vif-suppression
```

To disable wrong VIF suppression, use the commands:

```
awplus# configure terminal
awplus(config)# no ip pim sparse-mode wrong-vif-suppression
```

Related commands [ip pim sparse-mode join-prune-batching](#)

Command changes Version 5.4.8-2.3: command added.

ip pim spt-threshold

Overview This command turns on the ability for the last-hop PIM router to switch to SPT (shortest-path tree).

The **no** variant of this command turns off the ability for the last-hop PIM router to switch to SPT.

NOTE: *The switching to SPT happens either at the receiving of the first data packet, or not at all; it is not rate-based.*

Syntax ip pim spt-threshold
no ip pim spt-threshold

Mode Global Configuration

Examples To enable the last-hop PIM-SM router to switch to SPT, use the following commands:

```
awplus# configure terminal
awplus(config)# ip pim spt-threshold
```

To stop the last-hop PIM-SM router from being able to switch to SPT, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip pim spt-threshold
```

Related commands [ip pim spt-threshold group-list](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim spt-threshold group-list

Overview Use this command to turn on the ability for the last-hop PIM router to switch to SPT (shortest-path tree) for multicast group addresses specified by the given access-list.

The switching to SPT happens either at the receiving of the first data packet, or not at all; it is not rate-based.

Use the **no** variant of this command to turn off switching to the SPT.

Syntax `ip pim spt-threshold group-list <acl>`
`no ip pim spt-threshold group-list [<acl>]`

Parameter	Description
<acl>	The standard, expanded or named ACL to use.

Mode Global Configuration

Usage notes Turn on/off the ability for the last-hop PIM router to switch to SPT for multicast group addresses specified by the given access-list.

Example `awplus# configure terminal`
`awplus(config)# ip pim spt-threshold group-list 1`
`awplus(config)# access-list 1 permit 224.0.1.3`

Related commands [ip pim spt-threshold](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

ip pim ssm

Overview Use this command to define the Source Specific Multicast (SSM) range of IP multicast addresses. The default keyword defines the SSM range as 232/8.

To define the SSM range to be other than the default, use the **access-list** parameter option.

Use the **no** variant of this command to disable the SSM range.

Syntax `ip pim ssm default`
`ip pim ssm range {<access-list>|<named-access-list>}`
`no ip pim ssm`

Parameter	Description
default	Use 232/8 as the range for SSM.
<access-list>	<1-99> Simple access-list.
<named-access-list>	Named Standard Access List.

Default By default, the command is disabled.

Mode Global Configuration

Usage When an SSM range of IP multicast addresses is defined by this command, the no (*,G) or (S,G,rpt) state will be initiated for groups in the SSM range. The messages corresponding to these states will not be accepted or originated in the SSM range.

Examples To configure the SSM service for the IP address range defined by access list 10, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 10 permit 225.1.1.1
awplus(config)# ip pim ssm range 10
```

To use the default address range for PIM-SSM, use the commands:

```
awplus# configure terminal
awplus(config)# ip pim ssm default
```

To disable PIM-SSM, use the commands:

```
awplus# configure terminal
awplus(config)# no ip pim ssm
```

Command changes Version 5.5.3-1.1: VRF-lite support added.

service pim

Overview Use this command to enable the PIM Sparse Mode service.
Use the **no** version of the command to disable the PIM Sparse Mode service if you are not using it.

Syntax service pim
no service pim

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using PIM-SM. Enable it before configuring PIM-SM or PIM-SSM.
If you disable the service, that change won't take effect until you save the configuration and restart the device.

Example To enable the PIM sparse mode service, use the commands:

```
awplus# configure terminal  
awplus(config)# service pim
```

To disable the service, use the commands:

```
awplus# configure terminal  
awplus(config)# no service pim
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit  
awplus# write  
awplus# reboot
```

Command changes Version 5.5.5-0.1: default changed to disabled
Version 5.5.0-0.1: command added

show debugging pim sparse-mode

Overview This command displays the status of the debugging of the system.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging pim sparse-mode

Mode User Exec and Privileged Exec

Example To display PIM-SM debugging settings, use the command:
awplus# show debugging pim sparse-mode

Output The following shows typical output.

Output from show debugging pim sparse-mode

```
Debugging status:
PIM event debugging is on
PIM Hello THT timer debugging is on
PIM event debugging is on
PIM MFC debugging is on
PIM state debugging is on
PIM packet debugging is on
PIM incoming packet debugging is on
PIM outgoing packet debugging is on
```

Related commands [debug pim sparse-mode](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode bsr-router

Overview Use this command to show the Bootstrap Router (BSR) (v2) address.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode bsr-router

Mode User Exec and Privileged Exec

Example To show the Bootstrap Router (BSR) (v2) address, use the command:
awplus# show ip pim sparse-mode bsr-router

Output The following shows typical output.

Output from the show ip pim sparse-mode bsr-router command

```
PIMv2 Bootstrap information
BSR address: 10.10.11.35 (?)
Uptime:      00:00:38, BSR Priority: 0, Hash mask length: 10
Expires:     00:01:32
Role: Non-candidate BSR
State: Accept Preferred
```

Related commands [show ip pim sparse-mode rp mapping](#)
[show ip pim sparse-mode neighbor](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode interface

Overview Use this command to show PIM-SM interface information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)

Syntax show ip pim sparse-mode interface

Mode User Exec and Privileged Exec

Example To display information about PIM-SM interfaces, use the command:

```
awplus# show ip pim sparse-mode interface
```

Output The following shows typical output.

Example output from show ip pim sparse-mode interface

```
Total configured interfaces: 100    Maximum allowed: 100
Total active interfaces:      100

Address          Interface VIFindex Ver/  Nbr   DR      DR
                  Mode    Count  Prior
10.1.100.4       vlan100   4      v2/S   2      1      10.1.100.6
10.2.101.10      vlan1001  5      v2/S   0      1      10.2.101.10
10.2.102.10      vlan1002  6      v2/S   0      1      10.2.102.10
10.2.103.10      vlan1003  7      v2/S   0      1      10.2.103.10
10.2.104.10      vlan1004  8      v2/S   0      1      10.2.104.10
10.2.105.10      vlan1005  9      v2/S   0      1      10.2.105.10
10.2.106.10      vlan1006 10      v2/S   0      1      10.2.106.10
10.2.107.10      vlan1007 11      v2/S   0      1      10.2.107.10
...
```

Parameters in the output from the show ip pim sparse-mode interface command

Parameters	Description
Total configured interfaces	The number of configured PIM Sparse Mode interfaces.
Maximum allowed	The maximum number of PIM Sparse Mode interfaces that can be configured.
Total active interfaces	The number of active PIM Sparse Mode interfaces.
Address	Primary PIM-SM address.
Interface	Name of the PIM-SM interface.

Parameters	Description
VIF Index	The Virtual Interface index of the interface.
Ver/Mode	PIM version/Sparse mode.
Nbr Count	Neighbor count of the PIM-SM interface.
DR Priority	Designated Router priority.
DR	The IP address of the Designated Router.

Related commands [ip pim sparse-mode](#)
[show ip pim sparse-mode rp mapping](#)
[show ip pim sparse-mode neighbor](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode interface detail

Overview Use this command to show detailed information on a PIM-SM interface.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode interface detail

Mode User Exec and Privileged Exec

Example To display detailed information about PIM-SM interfaces, use the command:

```
awplus# show ip pim sparse-mode interface detail
```

Output The following shows typical output.

Example output from the show ip pim sparse-mode interface detail command

```
vlan3 (vif 3):  
  Address 192.168.1.149, DR 192.168.1.149  
  Hello period 30 seconds, Next Hello in 15 seconds  
  Triggered Hello period 5 seconds  
  Neighbors:  
    192.168.1.22  
  
vlan2 (vif 0):  
  Address 10.10.11.149, DR 10.10.11.149  
  Hello period 30 seconds, Next Hello in 18 seconds  
  Triggered Hello period 5 seconds  
  Neighbors:  
    10.10.11.4
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode local-members

Overview Use this command to show detailed local member information on an interface configured for PIM-SM. If you do not specify an interface then detailed local member information is shown for all interfaces configured for PIM-SM.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode local-members [<interface>]

Parameter	Description
<interface>	Optional. Specify the interface.

Mode User Exec and Privileged Exec

Example To show detailed PIM-SM information for all PIM-SM configured interfaces, use the command:

```
awplus# show ip pim sparse-mode local-members
```

To show detailed PIM-SM information for the PIM-SM configured interface vlan1, use the command:

```
awplus# show ip pim sparse-mode local-members vlan1
```

Output The following shows typical output.

Example output from the show ip pim sparse-mode local-members command

```
awplus#show ip pim sparse-mode local-members
PIM Local membership information

vlan1:
  (*, 224.0.0.4) : Include

vlan203:
  (*, 223.0.0.3) : Include
```

Output The following shows typical output.

Example output from the show ip pim sparse-mode local-members command on a specific interface.

```
awplus#show ip pim sparse-mode local-members vlan1
PIM Local membership information

vlan1:
  (*, 224.0.0.4) : Include
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode mroute

Overview Use this command to display the IP multicast routing table or the IP multicast routing table based on a specific address or addresses.

Syntax show ip pim sparse-mode mroute brief
show ip pim sparse-mode mroute
show ip pim sparse-mode mroute <group-address>
show ip pim sparse-mode mroute <source-address>
show ip pim sparse-mode mroute <source-address> <group-address>

Parameter	Description
brief	Shows only a summary of the number of each type of multicast entry and the cache.
<group-address>	Group IP address, entered in the form A.B.C.D. Output is all multicast entries belonging to that group.
<source-address>	Source IP address, entered in the form A.B.C.D. Output is all multicast entries belonging to that source.

Mode Privileged Exec

Usage notes Note that when a feature license is enabled, the output for the **show ip pim sparse-mode mroute** command will only show 32 interfaces because of the terminal display width limit. Use the **show ip pim sparse-mode mroute detail** command to display detailed entries of the IP multicast routing table.

Example To display the IP multicast routing table for the address 40.40.40.11, enter the command:

```
awplus# show ip pim sparse-mode mroute 40.40.40.11
```

Output The following shows typical output.

Example output from show ip pim sparse-mode mroute brief

```
awplus#show ip pim sparse-mode mroute brief
IP Multicast Routing Table

(*,*,RP) Entries: 0
(*,G) Entries: 0
(S,G) Entries: 99
(S,G,rpt) Entries: 99
FCR Entries: 0
MRIB Msg Cache Hit: 0
```

Output The following shows typical output.

Example output from show ip pim sparse-mode mroute

```
awplus#show ip pim sparse-mode mroute
IP Multicast Routing Table

(*,*,RP) Entries: 0
(*,G) Entries: 0
(S,G) Entries: 99
(S,G,rpt) Entries: 99
FCR Entries: 0
MRIB Msg Cache Hit: 0

(10.200.0.2, 224.1.1.1)
RPF nbr: 0.0.0.0
RPF idx: None
SPT bit: 1
Upstream State: JOINED
  Local          1
  Joined         0
  Asserted Winner 0
  Asserted Loser  0
  Outgoing       1
  Interop        listener  rx-data  flags (ES,EDW,RXD,DAJ,EOE)
                   0x00000000 0x00000000 0x00000001
(10.200.0.2, 224.1.1.1, rpt)
RP: 0.0.0.0
RPF nbr: 0.0.0.0
RPF idx: None
Upstream State: RPT NOT JOINED
  Local          0
  Pruned         0
  Outgoing       0
  Interop        listener  rx-data  flags (ES,EDW,RXD,DAJ,EOE)
                   0x00000000 0x00000000 0x00000001
...
```

Related commands [show ip pim sparse-mode mroute detail](#)

Command changes Version 5.4.7-1.1: VRF-lite support added to SBx8100.

Version 5.4.8-1.1: VRF-lite support added to x930, SBx908 GEN2.

Version 5.4.8-2.1: **brief** parameter added.

show ip pim sparse-mode mroute detail

Overview Use this command to display detailed entries of the IP multicast routing table, or detailed entries of the IP multicast routing table based on the specified address or addresses.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode mroute [*<group-address>*] detail
show ip pim sparse-mode mroute [*<source-address>*] detail
show ip pim sparse-mode mroute [*<group-address>* *<source-address>*] detail
show ip pim sparse-mode mroute [*<source-address>* *<group-address>*] detail

Parameter	Description
<i><group-address></i>	Group IP address, entered in the form A.B.C.D. Output is all multicast entries belonging to that group.
<i><source-address></i>	Source IP address, entered in the form A.B.C.D. Output is all multicast entries belonging to that source.
detail	Show detailed information.

Usage notes Based on the group and source address, the output is the selected route if present in the multicast route tree.

Mode User Exec and Privileged Exec

Examples The following example commands show detailed entries for IP multicast routing tables:

```
awplus# show ip pim sparse-mode mroute detail
awplus# show ip pim sparse-mode mroute 40.40.40.11 detail
awplus# show ip pim sparse-mode mroute 224.1.1.1 detail
awplus# show ip pim sparse-mode mroute 224.1.1.1 40.40.40.11
detail
```


Output The following shows typical output.

Example output from show ip pim sparse-mode mroute detail

```
IP Multicast Routing Table

(*,*,RP) Entries: 0
(*,G) Entries: 4
(S,G) Entries: 0
(S,G,rpt) Entries: 0
FCR Entries: 0

(*, 224.0.1.24) Uptime: 00:06:42
RP: 0.0.0.0, RPF nbr: None, RPF idx: None
Upstream:
  State: JOINED, SPT Switch: Disabled, JT: off
  Macro state: Join Desired,
Downstream:
  vlan2:
    State: NO INFO, ET: off, PPT: off
    Assert State: NO INFO, AT: off
    Winner: 0.0.0.0, Metric: 4294967295l, Pref: 4294967295l,
RPT bit: on
  Macro state: Could Assert, Assert Track
Local Olist:
  vlan2
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode neighbor

Overview Use this command to show the PIM-SM neighbor information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax `show ip pim sparse-mode neighbor [<interface>] [<ip-address>]
[detail]`

Parameter	Description
<interface>	Interface name. Show neighbors on an interface.
<ip-address>	Show neighbors with a particular address on an interface. The IP address entered in the form A.B.C.D.
detail	Show detailed information.

Mode Privileged Exec

Examples To show the neighbor information for all interfaces, use the command:

```
awplus# show ip pim sparse-mode neighbor
```

To show the neighbor information for vlan5, use the command:

```
awplus# show ip pim sparse-mode neighbor vlan5 detail
```

Output The following shows typical output.

Example output from the show ip pim sparse-mode neighbor command

Neighbor Address Mode	Interface	Uptime/Expires	Ver	DR Priority/
10.10.0.9	vlan2	00:55:33/00:01:44	v2	1 /
10.10.0.136	vlan2	00:55:20/00:01:25	v2	1 /
10.10.0.172	vlan2	00:55:33/00:01:32	v2	1 / DR
192.168.0.100	vlan3	00:55:30/00:01:20	v2	N / DR

Example output from the show ip pim sparse-mode neighbor interface detail command

```
Nbr 10.10.3.180 (vlan5), DR
Expires in 55 seconds, uptime 00:00:15
Holdtime: 70 secs, T-bit: off, Lan delay: 1, Override interval: 3
DR priority: 100, Gen ID: 625159467,
Secondary addresses:
  192.168.30.1
```

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode nexthop

Overview Use this command to see the next hop information as used by PIM-SM.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)

Syntax show ip pim sparse-mode nexthop

Mode User Exec and Privileged Exec

Example awplus# show ip pim sparse-mode nexthop

Output The following shows typical output.

Example output from the show ip pim sparse-mode nexthop command

Flags: N = New, R = RP, S = Source, U = Unreachable								
Destination	Type	Nexthop Num	Nexthop Addr	Nexthop	Nexthop Ifindex	Metric	Pref	Refcnt
10.10.0.9	.RS.	1	0.0.0.0	4	0	0	1	

Parameters in output of the show ip pim sparse-mode nexthop command

Parameter	Description
Destination	The destination address for which PIM-SM requires next hop information.
Type	The type of destination, as indicated by the Flags description. N = New, R= RP, S = Source, U = Unreachable.
Nexthop Num	The number of next hops to the destination. PIM-SM always uses only 1 next hop.
Nexthop Addr	The address of the primary next hop gateway.
Nexthop IfIndex	The interface on which the next hop gateway can be reached.
Nexthop Name	The name of next hop interface.
Metric	The metric of the route towards the destination.
Preference	The preference of the route towards destination.
Refcnt	Only used for debugging.

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode packet statistics

Overview Use this command to display the current packet receive counts for PIM sparse-mode.

Syntax show ip pim sparse-mode packet statistics

Mode Privileged Exec

Example The following command displays the current packet receive counts for PIM sparse-mode:

```
awplus# configure terminal
awplus(config)# show ip pim sparse-mode statistics
```

Output The following shows typical output.

Example output from show ip pim sparse-mode statistics

```
awplus(config)#show ip pim sparse-mode statistics
PIM-SM Receive Packet Statistics :
All PIM-SM      :   Total : 25   Valid : 25
Hello           :   Total : 14   Valid : 14
Register        :   Total : 5    Valid : 5
Register Stop   :   Total : 0    Valid : 0
Join/Prune      :   Total : 0    Valid : 0
Bootstrap       :   Total : 6    Valid : 6
Assert          :   Total : 0    Valid : 0
Candidate-RP    :   Total : 0    Valid : 0
```

Related commands [clear ip pim sparse-mode packet statistics](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode rp-hash

Overview Use this command to display the Rendezvous Point (RP) to be chosen based on the group selected.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode rp-hash *<group-addr>*

Parameter	Description
<i><group-addr></i>	The group address for which to find the RP, entered in the form A.B.C.D.

Mode User Exec and Privileged Exec

Example awplus# show ip pim sparse-mode rp-hash 224.0.1.3

Output The following shows typical output.

Output from the show ip pim sparse-mode rp-hash command

```
RP: 10.10.11.35  
Info source: 10.10.11.35, via bootstrap
```

Related commands [show ip pim sparse-mode rp mapping](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

show ip pim sparse-mode rp mapping

Overview Use this command to show group-to-RP (Rendezvous Point) mappings, and the RP set.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim sparse-mode rp mapping

Mode Privileged Exec

Example awplus# show ip pim sparse-mode rp mapping

Output The following shows typical output.

Example output from show ip pim sparse-mode rp mapping

```
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 10.10.0.9
    Info source: 10.10.0.9, via bootstrap, priority 192
        Uptime: 16:52:39, expires: 00:02:50
```

Related commands [show ip pim sparse-mode rp-hash](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

undebbug all pim sparse-mode

Overview Use this command to disable all PIM-SM debugging.

Syntax undebbug all pim sparse-mode

Mode Privileged Exec

Example awplus# undebbug all pim sparse-mode

Related commands [debug pim sparse-mode](#)

Command changes Version 5.4.7-1.1: VRF-lite support added SBx8100.
Version 5.4.8-1.1: VRF-lite support added x930, SBx908 GEN2.

34

PIM-SMv6 Commands

- Contents**
- **Introduction** on page 1656
 - **clear ipv6 mroute pim** on page 1657
 - **clear ipv6 mroute pim sparse-mode** on page 1658
 - **clear ipv6 pim sparse-mode bsr rp-set *** on page 1659
 - **debug ipv6 pim sparse-mode** on page 1660
 - **debug ipv6 pim sparse-mode packet** on page 1662
 - **debug ipv6 pim sparse-mode timer** on page 1663
 - **ipv6 pim accept-register** on page 1666
 - **ipv6 pim anycast-rp** on page 1667
 - **ipv6 pim bsr-border** on page 1669
 - **ipv6 pim bsr-candidate** on page 1670
 - **ipv6 pim cisco-register-checksum** on page 1671
 - **ipv6 pim cisco-register-checksum group-list** on page 1672
 - **ipv6 pim crp-cisco-prefix** on page 1673
 - **ipv6 pim dr-priority** on page 1674
 - **ipv6 pim exclude-genid** on page 1675
 - **ipv6 pim ext-srcs-directly-connected** on page 1676
 - **ipv6 pim hello-holdtime** on page 1677
 - **ipv6 pim hello-interval** on page 1678
 - **ipv6 pim ignore-rp-set-priority** on page 1679
 - **ipv6 pim jp-timer** on page 1680
 - **ipv6 pim neighbor-filter** on page 1681
 - **ipv6 pim register-rate-limit** on page 1682
 - **ipv6 pim register-rp-reachability** on page 1683
 - **ipv6 pim register-source** on page 1684
 - **ipv6 pim register-suppression** on page 1686
 - **ipv6 pim rp-address** on page 1687
 - **ipv6 pim rp-candidate** on page 1690
 - **ipv6 pim rp embedded** on page 1692
 - **ipv6 pim rp-register-kat** on page 1693
 - **ipv6 pim sparse-mode** on page 1694
 - **ipv6 pim sparse-mode passive** on page 1695
 - **ipv6 pim spt-threshold** on page 1696
 - **ipv6 pim spt-threshold group-list** on page 1697
 - **ipv6 pim ssm** on page 1698
 - **ipv6 pim unicast-bsm** on page 1699
 - **service pim6** on page 1700

- **show debugging ipv6 pim sparse-mode** on page 1701
- **show ipv6 pim sparse-mode bsr-router** on page 1702
- **show ipv6 pim sparse-mode interface** on page 1703
- **show ipv6 pim sparse-mode interface detail** on page 1705
- **show ipv6 pim sparse-mode local-members** on page 1706
- **show ipv6 pim sparse-mode mroute** on page 1708
- **show ipv6 pim sparse-mode mroute detail** on page 1710
- **show ipv6 pim sparse-mode neighbor** on page 1712
- **show ipv6 pim sparse-mode nexthop** on page 1713
- **show ipv6 pim sparse-mode rp-hash** on page 1715
- **show ipv6 pim sparse-mode rp mapping** on page 1716
- **show ipv6 pim sparse-mode rp nexthop** on page 1717
- **undebg all ipv6 pim sparse-mode** on page 1719
- **undebg ipv6 pim sparse-mode** on page 1720

Introduction

Overview This chapter provides an alphabetical reference of PIM-SMv6 commands. For IPv6 Multicast commands, see **Multicast Commands**. For an overview of PIM-SMv6, see the **PIM-SMv6 Feature Overview and Configuration Guide**.

IPv6 must be enabled on an interface with the **ipv6 enable** command, IPv6 forwarding must be enabled globally for routing IPv6 with the **ipv6 forwarding** command, and IPv6 multicasting must be enabled globally with the **ipv6 multicast-routing** command before using PIM-SMv6 commands.

Static IPv6 multicast routes take priority over dynamic IPv6 multicast routes. Use the **clear ipv6 mroute** command to clear static IPv6 multicast routes and ensure dynamic IPv6 multicast routes can take over from previous IPv6 static multicast routes.

NOTE: The IPv6 Multicast addresses shown can be derived from IPv6 unicast prefixes as per RFC 3306. The IPv6 unicast prefix reserved for documentation is 2001:0db8::/32 as per RFC 3849. Using the base /32 prefix the IPv6 multicast prefix for 2001:0db8::/32 is ff3x:20:2001:0db8::/64. Where an RP address is 2001:0db8::1 the embedded RP multicast prefix is ff7x:120:2001:0db8::/96. For ASM (Any-Source Multicast) the IPv6 multicast addresses allocated for documentation purposes are ff0x::0db8:0:0/96 as per RFC 6676. This is a /96 prefix so that it can be used with group IDs as per RFC 3307. These addresses should not be used for practical networks (other than for testing purposes), nor should they appear in any public network.

The IPv6 addresses shown use the address space 2001:0db8::/32, defined in RFC 3849 for documentation purposes. These addresses should not be used for practical networks (other than for testing purposes) nor should they appear on any public network.

clear ipv6 mroute pim

Overview Use this command to clear all Multicast Forwarding Cache (MFC) entries in PIM-SMv6.

NOTE: Static IPv6 multicast routes take priority over dynamic IPv6 multicast routes. Use the command to clear static IPv6 multicast routes and ensure dynamic IPv6 multicast routes can take over from previous static IPv6 multicast routes.

Syntax clear ipv6 mroute [*] pim sparse-mode

Parameter	Description
*	Clears all PIM-SMv6 multicast routes. Using this command without this optional operator only deletes the multicast router table entries.

Mode Privileged Exec

Example awplus# clear ipv6 mroute pim sparse-mode
awplus# clear ipv6 mroute * pim sparse-mode

clear ipv6 mroute pim sparse-mode

Overview Use this command to clear all multicast route table entries learned through PIM-SMv6 for a specified multicast group address, and optionally a specified multicast source address.

NOTE: Static IPv6 multicast routes take priority over dynamic IPv6 multicast routes. Use the command to clear static IPv6 multicast routes and ensure dynamic IPv6 multicast routes can take over from previous static IPv6 multicast routes.

Syntax clear ipv6 mroute <Group-IPv6-add> pim sparse-mode
clear ipv6 mroute <Group-IPv6-add> <Source-IPv6-add> pim sparse-mode

Parameter	Description
<Group-IPv6-add>	Specify a multicast group IPv6 address, entered in the form X:X::X:X.
<Source-IPv6-add>	Specify a source group IPv6 address, entered in the form X:X::X:X.

Mode Privileged Exec

Example awplus# clear ipv6 mroute 2001:db8:: pim sparse-mode
awplus# clear ipv6 mroute 2001:db8:: 2002:db8:: pim sparse-mode

clear ipv6 pim sparse-mode bsr rp-set

*

Overview Use this command to clear all Rendezvous Point (RP) sets learned through the PIM-SMv6 Bootstrap Router (BSR).

NOTE: Static IPv6 multicast routes take priority over dynamic IPv6 multicast routes. Use the command to clear static IPv6 multicast routes and ensure dynamic IPv6 multicast routes can take over from previous static IPv6 multicast routes.

Syntax clear ipv6 pim sparse-mode bsr rp-set *

Parameter	Description
*	Clears all RP sets.

Mode Privileged Exec

Usage For multicast clients, note that one router will be automatically or statically designated as the RP, and all routers must explicitly join through the RP. A Designated Router (DR) sends periodic Join/Prune messages toward a group-specific RP for each group that it has active members.

For multicast sources, note that the Designated Router (DR) unicasts Register messages to the RP encapsulating the data packets from the multicast source. The RP forwards decapsulated data packets toward group members.

Example awplus# clear ipv6 pim sparse-mode bsr rp-set *

debug ipv6 pim sparse-mode

Overview Use this command to activate PIM-SMv6 debugging.

Use the **no** variant of this command to deactivate PIMv6 debugging.

Note that the **undebug ipv6 pim sparse-mode** command is an alias of the **no** variant of this command.

Syntax debug ipv6 pim sparse-mode [all] [events] [mfc] [mib] [nexthop] [nsm] [state] [timer]

no debug ipv6 pim sparse-mode [all] [events] [mfc] [mib] [nexthop] [nsm] [state] [timer]

Parameter	Description
all	Activates/deactivates all PIM-SMv6 debugging.
events	Activates debug printing of PIM-SMv6 events.
mfc	Activates debug printing of MFC (Multicast Forwarding Cache).
mib	Activates debug printing of PIM-SMv6 MIBs.
nexthop	Activates debug printing of PIM-SMv6 next hop communications.
nsm	Activates debugging of PIM-SMv6 NSM (Network Services Module) communications.
state	Activates debug printing of state transition on all PIM-SMv6 FSMs.
timer	Activates debug printing of PIM-SMv6 timers.

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# debug ipv6 pim sparse-mode all
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# debug ipv6 pim sparse-mode events
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# debug ipv6 pim sparse-mode nexthop

Validation output **Example output from the show debugging ipv6 pim sparse-mode command after issuing multiple debug ipv6 pim sparse-mode commands**

```
awplus#debug ipv6 pim sparse-mode state
awplus#debug ipv6 pim sparse-mode events
awplus#debug ipv6 pim sparse-mode packet
awplus#show debugging ipv6 pim sparse-mode
PIM-SMv6 debugging status:
  PIM event debugging is on
  PIM MFC debugging is off
  PIM state debugging is on
  PIM packet debugging is on
  PIM Hello HT timer debugging is off
  PIM Hello NLT timer debugging is off
  PIM Hello THT timer debugging is off
  PIM Join/Prune JT timer debugging is off
  PIM Join/Prune ET timer debugging is off
  PIM Join/Prune PPT timer debugging is off
  PIM Join/Prune KAT timer debugging is off
  PIM Join/Prune OT timer debugging is off
  PIM Assert AT timer debugging is off
  PIM Register RST timer debugging is off
  PIM Bootstrap BST timer debugging is off
  PIM Bootstrap CRP timer debugging is off
  PIM mib debugging is off
  PIM nsm debugging is off
  PIM nexthop debugging is off
```

Related commands **show debugging ipv6 pim sparse-mode**
undebug all ipv6 pim sparse-mode
undebug ipv6 pim sparse-mode

debug ipv6 pim sparse-mode packet

Overview Use this command to activate PIM-SMv6 packet debugging.

Use the no variant of this command to deactivate PIMv6 packet debugging.

Syntax debug ipv6 pim sparse-mode packet {in|out}
no debug ipv6 pim sparse-mode packet {in|out}

Parameter	Description
packet	Activates debug printing of incoming and/or outgoing IPv6 packets.
in	Specify incoming packet debugging.
out	Specify outgoing packet debugging.

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# debug ipv6 pim sparse-mode packet in
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# debug ipv6 pim sparse-mode packet out
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# no debug ipv6 pim sparse-mode packet in
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# no debug ipv6 pim sparse-mode packet out

Related commands [show debugging ipv6 pim sparse-mode](#)
[undebug all ipv6 pim sparse-mode](#)

debug ipv6 pim sparse-mode timer

Overview Use this command to enable debugging for the specified PIM-SMv6 timers.
Use the **no** variants of this command to disable debugging for the specified PIM-SMv6 timers.

Syntax debug ipv6 pim sparse-mode timer assert [at]
 no debug ipv6 pim sparse-mode timer assert [at]
 debug pim ipv6 sparse-mode timer bsr [bst|crp]
 no debug pim ipv6 sparse-mode timer bsr [bst|crp]
 debug pim ipv6 sparse-mode timer hello [ht|nlt|tth]
 no debug pim ipv6 sparse-mode timer hello [ht|nlt|tth]
 debug pim ipv6 sparse-mode timer joinprune [jt|et|ppt|kat|ot]
 no debug pim ipv6 sparse-mode timer joinprune [jt|et|ppt|kat|ot]
 debug pim ipv6 sparse-mode timer register [rst]
 no debug pim ipv6 sparse-mode timer register [rst]

Parameter	Description
assert	Enable or disable debugging for the Assert timers.
at	Enable or disable debugging for the Assert Timer.
bsr	Enable or disable debugging for the specified Bootstrap Router timer, or all Bootstrap Router timers.
bst	Enable or disable debugging for the Bootstrap Router: Bootstrap Timer.
crp	Enable or disable debugging for the Bootstrap Router: Candidate-RP Timer.
hello	Enable or disable debugging for the specified Hello timer, or all Hello timers.
ht	Enable or disable debugging for the Hello timer: Hello Timer.
nlt	Enable or disable debugging for the Hello timer: Neighbor Liveness Timer.
tth	Enable or disable debugging for the Hello timer: Triggered Hello Timer.
joinprune	Enable or disable debugging for the specified JoinPrune timer, or all JoinPrune timers.
jt	Enable or disable debugging for the JoinPrune timer: upstream Join Timer.
et	Enable or disable debugging for the JoinPrune timer: Expiry Timer.
ppt	Enable or disable debugging for the JoinPrune timer: PrunePending Timer.
kat	Enable or disable debugging for the JoinPrune timer: KeepAlive Timer.

Parameter	Description
ot	Enable or disable debugging for the JoinPrune timer: Upstream Override Timer.
register	Enable or disable debugging for the Register timers.
rst	Enable or disable debugging for the Register timer: Register Stop Timer.

Default By default, all debugging is disabled.

Mode Privileged Exec and Global Configuration

Examples To enable debugging for the PIM-SMv6 Bootstrap Router bootstrap timer, use the commands:

```
awplus(config)# debug ipv6 pim sparse-mode timer bsr bst
```

To enable debugging for the PIM-SMv6 Hello: neighbor liveness timer, use the command:

```
awplus(config)# debug ipv6 pim sparse-mode timer hello ht
```

To enable debugging for the PIM-SMv6 Joinprune expiry timer, use the command:

```
awplus# debug ipv6 pim sparse-mode timer joinprune et
```

To disable debugging for the PIM-SMv6 Register timer, use the command:

```
awplus# no debug ipv6 pim sparse-mode timer register
```

Related commands [show debugging ipv6 pim sparse-mode](#)

ipv6 pim accept-register

Overview Use this command to configure the ability to filter out multicast sources specified by the given software IPv6 access-list at the Rendezvous Point (RP), so that the RP will accept/refuse to perform the register mechanism for the packets sent by the specified sources. By default, the RP accepts register packets from all multicast sources.

Use the **no** variant of this command to revert to default.

Syntax `ipv6 pim accept-register list <access-list>`
`no ipv6 pim accept-register`

Parameter	Description
<code><access-list></code>	Specify a Standard or an Extended software IPv6 Access list. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Mode Global Configuration

Example To use the ACL named G2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard G2 permit
2001:db8::/128
awplus(config)# ipv6 pim accept-register list G2
```

To remove the configuration, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim accept-register
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim anycast-rp

Overview Use this command to configure Anycast RP (Rendezvous Point) in an RP set.

Use the **no** variant of this command to remove the configuration.

Syntax `ipv6 pim anycast-rp <anycast-rp-address> <member-rp-address>`
`no ipv6 pim anycast-rp <anycast-rp-address> [<member-rp-address>]`

Parameter	Description
<anycast-rp-address>	<X:X::X:X> Specify an Anycast IPv6 address to configure an Anycast RP (Rendezvous Point) in a RP set.
<member-rp-address>	<A:B::C:D> Specify an Anycast RP (Rendezvous Point) IPv6 address to configure an Anycast RP in a RP set.

Mode Global Configuration

Usage notes Anycast is a network addressing and routing scheme where data is routed to the nearest or best destination as viewed by the routing topology. Compared to unicast with a one-to-one association between network address and network endpoint, and multicast with a one-to-many association between network address and network endpoint; anycast has a one-to-many association between network address and network endpoint. For anycast, each destination address identifies a set of receiver endpoints, from which only one receiver endpoint is chosen.

Use this command to specify the Anycast RP configuration in the Anycast RP set. Use the **no** variant of this command to remove the Anycast RP configuration. Note that the member RP address is optional when using the **no** parameter to remove the Anycast RP configuration. Removing the Anycast RP address also removes the member RP address.

Examples The following example shows how to configure the Anycast RP address with **ipv6 pim anycast-rp**:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim anycast-rp 2:2::2:2 20:20::20:20
```

The following example shows how to remove the Anycast RP in the RP set specifying only the Anycast RP address with **no ipv6 pim anycast-rp**, but not specifying the member RP address:

```
awplus# configure terminal
awplus(config)# no ipv6 pim anycast-rp 2:2::2:2 20:20::20:20
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim bsr-border

Overview Use the **ipv6 pim bsr-border** command to prevent Bootstrap Router (BSR) messages from being sent or received through an interface. The BSR border is the border of the PIM-SMv6 domain.

Use the **no** variant of this command to disable the configuration set with **ipv6 pim bsr-border**.

Syntax `ipv6 pim bsr-border`
`no ipv6 pim bsr-border`

Mode Interface Configuration for a VLAN interface.

Usage When this command is configured on an interface, no PIM-SMv6 BSR messages will be sent or received through the interface. Configure an interface bordering another PIM-SMv6 domain with this command to avoid BSR messages from being exchanged between the two PIM-SMv6 domains.

BSR messages should not be exchanged between different domains, because devices in one domain may elect Rendezvous Points (RPs) in the other domain, resulting in loss of isolation between the two PIM domains that would stop the PIM-SMv6 protocol from working as intended.

Examples The following example configures the VLAN interface vlan2 to be the PIM-SMv6 domain border:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim bsr-border
```

The following example removes the VLAN interface vlan2 from the PIM-SMv6 domain border:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim bsr-border
```

ipv6 pim bsr-candidate

Overview Use this command to give the device the candidate BSR (Bootstrap Router) status using the specified IPv6 address mask of the interface.

Use the **no** variant of this command to withdraw the address of the interface from being offered as a BSR candidate.

Syntax `ipv6 pim bsr-candidate <interface> [<hash>] [<priority>]`
`no ipv6 pim bsr-candidate [<interface>]`

Parameter	Description
<interface>	Specify the interface.
<hash>	<0-128> configure the hash mask length used for RP selection. The default hash value if you do not configure this parameter is 126.
<priority>	<0-255> configure priority for a BSR candidate. Note that you must also specify the <hash> (mask length) when specifying the <priority>. The default priority if you do not configure this parameter is 64.

Mode Global Configuration

Default The default hash parameter value is 126 and the default priority parameter value is 64.

Examples To set the BSR candidate to the VLAN interface vlan2, with the optional mask length and BSR priority parameters, enter the commands shown below:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim bsr-candidate vlan2 20 30
```

To withdraw the address of vlan2 from being offered as a BSR candidate, enter:

```
awplus# configure terminal
awplus(config)# no ipv6 pim bsr-candidate vlan2
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim cisco-register-checksum

Overview Use this command to configure the option to calculate the Register Checksum over the whole packet. This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to disable this option.

Syntax `ipv6 pim cisco-register-checksum`
`no ipv6 pim cisco-register-checksum`

Default This command is disabled by default. By default, Register Checksum is calculated only over the header.

Mode Global Configuration

Example To calculate the Register Checksum over the whole packet, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim cisco-register-checksum
```

To return to calculating the Register Checksum over the header, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim cisco-register-checksum
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim cisco-register-checksum group-list

Overview Use this command to configure the option to calculate the Register Checksum over the whole packet on multicast groups as specified by the software IPv6 access-list. This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to revert to default settings.

Syntax `ipv6 pim cisco-register-checksum group-list <IPv6-access-list>`
`no ipv6 pim cisco-register-checksum group-list <IPv6-access-list>`

Parameter	Description
<code><IPv6-access-list></code>	Optional. Specify a Standard or Extended software IPv6 access list. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs. Use this parameter to configure the option to calculate the Register Checksum over the whole packet on multicast groups as specified by an IPv6 access list entered after this command.

Mode Global Configuration

Default This command is disabled by default. By default, Register Checksum is calculated only over the header.

Example To calculate the Register Checksum over the whole packet on the multicast groups ff0x::db8:0:0/96, as specified by the ACL named G1, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard G1 permit
ff0x::db8:0:0/96
awplus(config)# ipv6 pim cisco-register-checksum group-list G1
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim crp-cisco-prefix

Overview Use this command to interoperate with Cisco devices that conform to an earlier draft standard. Some Cisco devices might not accept candidate RPs with a group prefix number of zero. Note that the latest BSR specification prohibits sending RP advertisements with prefix 0.

Use the **no** variant of this command to revert to the default settings.

Syntax `ipv6 pim crp-cisco-prefix`
`no ipv6 pim crp-cisco-prefix`

Mode Global Configuration

Example To enable this option, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim crp-cisco-prefix
```

To disable this option again, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim crp-cisco-prefix
```

Related commands [ipv6 pim rp-candidate](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim dr-priority

Overview Use this command to set the Designated Router priority value.
Use the **no** variant of this command to disable this function.

Syntax `ipv6 pim dr-priority <priority>`
`no ipv6 pim dr-priority [<priority>]`

Parameter	Description
<code><priority></code>	Specify the Designated Router priority value, in the range 0 to 4294967294. Note that a higher value has a higher preference or higher priority.

Default The default value is 1. The negated form of this command restores the value to the default.

Mode Interface Configuration for a VLAN interface.

Examples To set the Designated Router priority value to 11234 for the VLAN interface vlan2, apply the commands as shown below:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim dr-priority 11234
```

To disable the Designated Router priority value for the VLAN interface vlan2, apply the commands as shown below:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim dr-priority
```

Related commands [ipv6 pim ignore-rp-set-priority](#)

ipv6 pim exclude-genid

Overview Use this command to exclude the GenID option from Hello packets sent out by the PIM-SMv6 module on a particular interface. This command is used to inter-operate with older Cisco IOS versions.

Use the **no** variant of this command to revert to default settings.

Syntax `ipv6 pim exclude-genid`
`no ipv6 pim exclude-genid`

Default By default, this command is disabled; the GenID option is included.

Mode Interface Configuration for a VLAN interface.

Examples To exclude the GenID option in Hello packets on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim exclude-genid
```

To include the GenID option in Hello packets, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim exclude-genid
```

ipv6 pim ext-srcs-directly-connected

Overview Use this command to configure PIM-SMv6 to treat all source traffic arriving on the interface as though it was sent from a host directly connected to the interface.

Use the **no** variant of this command to configure PIM-SMv6 to treat only directly connected sources as directly connected.

Syntax `ipv6 pim ext-srcs-directly-connected`
`no ipv6 pim ext-srcs-directly-connected`

Default The **no** variant of this command is the default behavior.

Mode Interface Configuration for a VLAN interface.

Example To configure PIM-SMv6 to treat all sources as directly connected for VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim ext-srcs-directly-connected
```

To configure PIM-SMv6 to treat only directly connected sources as directly connected for VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim ext-srcs-directly-connected
```


ipv6 pim hello-holdtime

Overview This command configures a hello-holdtime value. You cannot configure a hello-holdtime value that is less than the current hello-interval.

Use the **no** variant of this command to return it to its default of 3.5 * the current hello-interval.

Syntax `ipv6 pim hello-holdtime <holdtime>`
`no ipv6 pim hello-holdtime`

Parameter	Description
<holdtime>	<1-65535> The holdtime value in seconds (no fractional seconds are accepted).

Default The default hello-holdtime value is 3.5 * the current hello-interval. The default hello-holdtime is restored using the negated form of this command.

Mode Interface Configuration for a VLAN interface.

Usage Each time the hello-interval is updated, the hello-holdtime is also updated, according to the following rules:

If the hello-holdtime is not configured; or if the hello-holdtime is configured and less than the current hello-interval value, it is modified to the (3.5 * hello-interval). Otherwise, it retains the configured value.

Examples To configure a hello-holdtime of 123 seconds on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim hello-holdtime 123
```

To reset the hello-holdtime to default, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim hello-holdtime
```

ipv6 pim hello-interval

Overview This command configures a hello-interval value for PIM-SMv6.
Use the **no** variant of this command to reset the hello-interval for PIM-SMv6 to the default.

Syntax `ipv6 pim hello-interval <interval>`
`no ipv6 pim hello-interval`

Parameter	Description
<code><interval></code>	<code><1-65535></code> The value in seconds (no fractional seconds accepted).

Default The default hello-interval value is 30 seconds. The default is restored using the negated form of this command.

Mode Interface Configuration for a VLAN interface.

Usage When the hello-interval is configured, and the hello-holdtime is not configured, or when the configured hello-holdtime value is less than the new hello-interval value; the holdtime value is modified to the (3.5 * hello-interval). Otherwise, the hello-holdtime value is the configured value.

Example To set the hello-interval to 123 seconds on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim hello-interval 123
```

To set the hello-interval to the default on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim hello-interval
```

ipv6 pim ignore-rp-set-priority

Overview Use this command to ignore the RP-SET priority value, and use only the hashing mechanism for RP selection.

Use the **no** variant of this command to disable this setting.

Syntax `ipv6 pim ignore-rp-set-priority`
`no ipv6 pim ignore-rp-set-priority`

Mode Global Configuration

Usage This command is used to inter-operate with older Cisco IOS versions.

Example To enable this option, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim ignore-rp-set-priority
```

To disable this option again, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim ignore-rp-set-priority
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim jp-timer

Overview Use this command to set the PIM-SMv6 join/prune timer. Note that the value set by the join/prune timer is the value that the device puts into the holdtime field of the join/prune packets it sends to its neighbors.

Use the **no** variant of this command to return the PIM-SMv6 join/prune timer to its default value of 210 seconds.

Syntax `ipv6 pim jp-timer <1-65535>`
`no ipv6 pim jp-timer [<1-65535>]`

Parameter	Description
<1-65535>	Specifies the Join/Prune timer value. The default value is 210 seconds.

Default The default PIM-SMv6 join/prune timer value is 210 seconds.

Mode Global Configuration

Example To change the join/prune timer to 300 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim jp-timer 300
```

To return the join/prune timer to its default value, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim jp-timer
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim neighbor-filter

Overview This command enables filtering of neighbors on the VLAN interface. When configuring a neighbor filter, PIM-SMv6 will either not establish adjacency with the neighbor, or terminate adjacency with the existing neighbors if denied by the filtering IPv6 access list.

Use the **no** variant of this command to disable this function.

Syntax `ipv6 pim neighbor-filter <IPv6-accesslist>`
`no ipv6 pim neighbor-filter <IPv6-accesslist>`

Parameter	Description
<code><IPv6-accesslist></code>	Specify a Standard or an Extended software IPv6 access list name for the PIM-SMv6 neighbor filter. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Default By default, there is no neighbor filtering applied to an interface.

Mode Interface Configuration for a VLAN interface.

Example To enable filtering on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 access-list standard filter1 deny
fe80:20e:cff:fe01:facc
awplus(config-if)# ipv6 access-list standard filter1 permit any
awplus(config-if)# ipv6 pim neighbor-filter filter1
```

ipv6 pim register-rate-limit

Overview Use this command to configure the rate of register packets sent by this DR, in units of packets per second. The configured rate is per (S, G) state, and is not a system wide rate.

Use the **no** variant of this command to remove the limit.

Syntax `ipv6 pim register-rate-limit <1-65535>`
`no ipv6 pim register-rate-limit`

Parameter	Description
<1-65535>	Specifies the maximum number of packets that can be sent per second.

Mode Global Configuration

Default The default is 0, which means no rate limit.

Examples To set the rate limit to 3444 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim register-rate-limit 3444
```

To remove the rate limit, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim register-rate-limit
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim register-rp-reachability

Overview Use this command to enable the RP reachability check for PIMv6 Register processing at the DR. The default setting is no checking for RP-reachability.

Use the **no** variant of this command to disable this processing.

Syntax `ipv6 pim register-rp-reachability`
`no ipv6 pim register-rp-reachability`

Default This command is disabled; by default, there is no checking for RP-reachability.

Mode Global Configuration

Examples To check for RP reachability, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim register-rp-reachability
```

To stop checking for RP reachability, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim register-rp-reachability
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim register-source

Overview Use this command to configure the source IPv6 address of register packets sent by this DR, overriding the default source IPv6 address, which is the IPv6 address of the RPF interface toward the source host.

Use the **no** variant of this command to remove the IPv6 source address of Register packets sent by this DR, reverting back to use the default IPv6 source address that is the address of the RPF interface toward the source host.

Syntax `ipv6 pim register-source [<source-IPv6-address>|<interface>]`
`no ipv6 pim register-source`

Parameter	Description
<code><source-IPv6-address></code>	The IPv6 address, entered in the form X:X::X:X, to be used as the source of the register packets.
<code><interface></code>	The name of the interface to be used as the source of the register packets.

Mode Global Configuration

Usage The configured address must be a reachable address to be used by the RP to send corresponding Register-Stop messages in response. It is normally the local loopback IPv6 interface address, but can also be a physical IPv6 address. This IPv6 address must be advertised by unicast routing protocols on the DR. The configured interface does not have to be PIM-SMv6 enabled.

Mode Global Configuration

Examples To configure the register source as 3ffe::24:2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim register-source 3ffe::24:2
```

To configure the register source as vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim register-source vlan2
```

To change back to the default, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# no ipv6 pim register-source
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim register-suppression

Overview Use this command to configure the register-suppression time, in seconds, overriding the default of 60 seconds.

Use the **no** variant of this command to reset the value to its default of 60 seconds.

Syntax `ipv6 pim register-suppression <1-65535>`
`no ipv6 pim register-suppression`

Parameter	Description
<1-65535>	Register suppression on time in seconds.

Mode Global Configuration

Default 60 seconds

Usage Configuring this value modifies register-suppression time at the DR. Configuring this value at the RP modifies the RP-keepalive-period value if the **ipv6 pim rp-register-kat** is not used.

Examples To change the register-suppression time to 192 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim register-suppression 192
```

To return to the default register-suppression time of 60 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim register-suppression
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim rp-address

Overview Use this command to statically configure RP (Rendezvous Point) address for IPv6 multicast groups.

Use the **no** variant of this command to remove a statically configured RP (Rendezvous Point) address for IPv6 multicast groups.

Syntax `ipv6 pimv6 rp-address <IPv6-address> [<IPv6-access-list>] [override]`
`no ipv6 pim rp-address <IPv6-address> [<IPv6-access-list>] [override]`

Parameter	Description
<code><IPv6-address></code>	Specify the IPv6 address of the Rendezvous Point, entered in the form X:X::X:X.
<code><IPv6-access-list></code>	Specify a Standard or an Extended software IPv6 access-list name. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.
<code>override</code>	Specify this optional parameter keyword to enable any statically defined RPs to override dynamically learned RPs.

Mode Global Configuration

Usage notes The AlliedWare Plus™ PIM-SMv6 implementation supports multiple static RPs. It also supports usage of static RPs and the BSR mechanism simultaneously. This command is used to statically configure the RP address for IPv6 multicast groups.

You need to understand the following information before using this command:

If the RP address that is configured by the BSR, and the RP-address that is configured statically, are both available for a group range, then the RP address configured through BSR is chosen over the statically configured RP address.

A single static RP can be configured for multiple group ranges using software IPv6 access- lists (ACLs). However, configuring multiple static RPs with the same RP address is not allowed. The static RP can either be configured for the whole multicast group range ff00::/8 (without using IPv6 ACLs) or for specific group ranges (using IPv6 ACLs). For example:

- **ipv6 pim rp-address 3ffe:10:10:5::153** will configure static RP 3ffe:10:10:5::153 for the default group range ff00::/8.
- **ipv6 pim rp-address 3fee:20:20:5::153 grp-list** will configure static RP 3fee:20:20:5::153 for all the group ranges represented by permit filters in the defined named **grp-list** ACL.

If multiple static RPs are available for a group range, then one with the highest IPv6 address is chosen.

Only **permit** filters in IPv6 ACLs are considered as valid group ranges. The default **permit** filter ::/0 is converted to the default multicast filter ff00::/8.

After configuration, the RP address is inserted into a static RP group tree based on the configured group ranges. For each group range, multiple static RPs are maintained in a list. This list is sorted in a descending order of IPv6 addresses. When selecting static RPs for a group range, the first element (which is the static RP with highest IPv6 address) is chosen.

RP address deletion is handled by removing the static RP from all the existing group ranges and recalculating the RPs for existing TIB states if required.

Group mode and RP address mappings learned through BSR take precedence over mappings statistically defined by this command. Commands with the **override** parameter take precedence over dynamically learned mappings.

Examples To configure static-RP 3ffe:30:30:5::153 for the group range 2001:db8::/128 (specified in the permit filter in the ACL named G2), use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard G2 permit
                2001:db8::/128
awplus(config)# ipv6 pim rp-address 3ffe:30:30:5::153 G2
```

To undo that configuration, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim rp-address 3ffe:30:30:5::153 G2
```

Related commands [ipv6 pim rp-candidate](#)
[ipv6 pim rp-register-kat](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim rp-candidate

Overview Use this command to make the device an RP (Rendezvous Point) candidate, using the IPv6 address of the specified interface.

Use the **no** variant of this command to stop the device from being an RP candidate.

Syntax `ipv6 pim rp-candidate <interface> [priority <priority>|interval <interval>|grouplist <accesslist>]`
`no ipv6 pim rp-candidate [<interface>]`

Parameter	Description
<interface>	The interface name.
priority <priority>	The RP candidate priority for this interface on this device, from 0 to 255. The lower the priority value, the more likely this candidate is to become the RP.
interval <interval>	The advertisement interval, from 1 to 16383 seconds.
grouplist <accesslist>	A Standard or an Extended software IPv6 access list name. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Default The priority value for a candidate RP is 192 by default until specified using the **priority** parameter.

Mode Global Configuration

Usage notes Note that issuing the command **ipv6 pim rp-candidate <interface>** without optional **priority**, **interval**, or **grouplist** parameters will configure the candidate RP with a priority value of 192.

Examples To specify a priority of 3, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim rp-candidate vlan2 priority 3
```

To stop the device from being an RP candidate on vlan2 , use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim rp-candidate vlan2
```

To use the ACL named G2 to specify the group prefixes that are advertised in association with the RP address, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 access-list standard G2 permit
                2001:db8::/128
awplus(config)# ipv6 pim rp-candidate vlan2 group-list G2
```

Related commands [ipv6 pim rp-address](#)
[ipv6 pim rp-register-kat](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim rp embedded

Overview Use this command to configure and enable embedded RP (Rendezvous Point) in PIM-SMv6.

This command only applies to the embedded RP group range **ff7x::/12** and **fffx::/12**.

Use the **no** variant of this command to disable embedded RP support. Since embedded RP support is enabled by default, use the **no** variant of this command to disable the default.

Syntax `ipv6 pim rp embedded`
`no ipv6 pim rp embedded`

Mode Global Configuration

Default Enabled

Examples The following example re-enables embedded RP support, the default state in PIM-SMv6:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim rp embedded
```

The following example disables embedded RP support, which is enabled by default in PIM-SMv6:

```
awplus# configure terminal
awplus(config)# no ipv6 pim rp embedded
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim rp-register-kat

Overview Use this command to configure the Keep Alive Time (KAT) for (S,G) states at the RP (Rendezvous Point) to monitor PIM-SMv6 Register packets.

Use the **no** variant of this command to return the PIM-SMv6 KAT timer to its default value of 210 seconds.

Syntax `ipv6 pim rp-register-kat <1-65535>`
`no ipv6 pim rp-register-kat`

Parameter	Description
<1-65536>	Specify the KAT timer in seconds. The default value is 210 seconds.

Mode Global Configuration

Default The default PIM-SMv6 KAT timer value is 210 seconds.

Examples To change the KAT timer to 3454 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim rp-register-kat 3454
```

To return the KAT timer to its default setting, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim rp-register-kat
```

Related commands [ipv6 pim rp-address](#)
[ipv6 pim rp-candidate](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim sparse-mode

Overview Use this command to enable PIM-SMv6 on an interface.
Use the **no** variant of this command to disable PIM-SMv6 on an interface.

Syntax `ipv6 pim sparse-mode`
`no ipv6 pim sparse-mode`

Mode Interface Configuration for a VLAN interface.

Examples To enable PIM-SMv6 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim sparse-mode
```

To disable PIM-SMv6 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim sparse-mode
```

ipv6 pim sparse-mode passive

Overview Use this command to enable and disable PIM-SMv6 passive mode operation for local members on an interface.

Use the **no** variant of this command to disable PIM-SMv6 passive mode operation for local members on an interface.

Syntax `ipv6 pim sparse-mode passive`
`no ipv6 pim sparse-mode passive`

Mode Interface Configuration for a VLAN interface.

Usage Passive mode essentially stops PIM-SMv6 transactions on the interface, allowing only the MLD mechanism to be active.

Examples To enable passive mode on vlan2, use the commands

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim sparse-mode passive
```

To disable passive mode on vlan2, use the commands

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim sparse-mode passive
```

ipv6 pim spt-threshold

Overview This command turns on the ability for the last-hop PIM-SMv6 router to switch to SPT (shortest-path tree).

The **no** variant of this command turns off the ability for the last-hop PIM-SMv6 router to switch to SPT.

NOTE: *The switching to SPT happens either at the receiving of the first data packet, or not at all; it is not rate-based.*

Syntax `ipv6 pim spt-threshold`
`no ipv6 pim spt-threshold`

Mode Global Configuration

Examples To enable the last-hop PIM-SMv6 router to switch to SPT, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim spt-threshold
```

To stop the last-hop PIM-SMv6 router from being able to switch to SPT, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim spt-threshold
```

Related commands [ipv6 pim spt-threshold group-list](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim spt-threshold group-list

Overview Use this command to turn on/off the ability for the last-hop PIM-SMv6 router to switch to SPT (shortest-path tree) for multicast group addresses as specified by the given software IPv6 access-list.

Use the **no** variant of this command to turn off switching to the SPT.

NOTE: *The switching to SPT happens either at the receiving of the first data packet, or not at all; it is not rate-based.*

Syntax `ipv6 pim spt-threshold group-list <IPv6-access-list>`
`no ipv6 pim spt-threshold group-list <IPv6-access-list>`

Parameter	Description
<IPv6-access-list>	Specify a Standard or an Extended software IPv6 access-list name. See IPv6 Software Access Control List (ACL) Commands for supported IPv6 ACLs.

Mode Global Configuration

Examples To enable the last-hop PIM-SMv6 router to switch to SPT for groups specified by the ACL named G1, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# ipv6 pim spt-threshold group-list G1
awplus(config)# ipv6 access-list standard G1 permit
2001:db8::/128
```

To stop the last-hop PIM-SMv6 router from being able to switch to SPT for groups specified by the ACL named G1, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim spt-threshold group-list G1
```

Related commands [ipv6 pim spt-threshold](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim ssm

Overview Use this command to define the Source Specific Multicast (SSM) range of IPv6 multicast addresses. PIM-SMv6 routers will only install (S,G) entries for multicast groups (addresses) residing in the SSM range.

Use the **no** variant of this command to disable the SSM range.

Syntax `ipv6 pim ssm range <named-access-list>`
`ipv6 pim ssm default`
`no ipv6 pim ssm`

Parameter	Description
default	Use FF3x::/32 as the range for SSM.
range	Specify an ACL for group range to be used for SSM.
<named-access-list>	Specify a named standard access list.

Default Disabled

Mode Global Configuration

Usage Any (*,G) or (S,G,rpt) joins received for multicast groups (addresses) within the range are not installed in PIM-SMv6 mroute table.

Examples To configure the SSM service for the IPv6 address range defined by IPv6 access list 'IPv6-PIM-SSM-RANGE', use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard IPv6-PIM-SSM-RANGE
permit ff3e::/32
awplus(config)# ipv6 pim ssm range IPv6-PIM-SSM-RANGE
```

To use the default address range for PIM-SSM, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 pim ssm default
```

To disable PIM-SSM, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 pim ssm
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

ipv6 pim unicast-bsm

Overview Use this command to enable support for the sending and receiving of unicast Boot Strap Messages (BSM) on an interface.

Use the **no** variant of this command to disable the sending and receiving of unicast BSM on an interface.

Syntax `ipv6 pim unicast-bsm`
`no ipv6 pim unicast-bsm`

Mode Interface Configuration for a VLAN interface.

Default Unicast BSM is disabled by default on an interface.

Usage This command provides backward compatibility with older versions of the Boot Strap Router (BSR) specification, which directs unicast BSM to refresh the state of new or restarting neighbors. The current BSR specification defines a No Forward BSM to achieve the same result.

Examples To enable BSM messages on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 forwarding
awplus(config)# ipv6 multicast-routing
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 pim unicast-bsm
```

To disable BSM messages on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 pim unicast-bsm
```

service pim6

Overview Use this command to enable the IPv6 PIM Sparse Mode service.

Use the **no** version of the command to disable the IPv6 PIM Sparse Mode service if you are not using it.

Syntax service pim6
no service pim6

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using PIM. Enable it before configuring IPv6 PIM-SM or PIM-SSM.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the IPv6 PIM Sparse Mode service, use the commands:

```
awplus# configure terminal
awplus(config)# service pim6
```

To disable the service, use the commands:

```
awplus# configure terminal
awplus(config)# no service pim6
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: default changed to disabled
Version 5.5.0-0.1: command added

show debugging ipv6 pim sparse-mode

Overview Use this command to see what debugging is turned on for PIM-SMv6.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging ipv6 pim sparse-mode

Mode User Exec and Privileged Exec

Example To display PIM-SMv6 debugging settings, use the command:

```
awplus# show debugging ipv6 pim sparse-mode
```

Output The following shows typical output.

Example output from the show debugging ipv6 pim sparse-mode command

```
awplus#show debugging ipv6 pim sparse-mode
Debugging status:
  PIM event debugging is on
  PIM MFC debugging is on
  PIM state debugging is on
  PIM packet debugging is on
  PIM Hello HT timer debugging is on
  PIM Hello NLT timer debugging is on
  PIM Hello THT timer debugging is on
  PIM Join/Prune JT timer debugging is on
  PIM Join/Prune ET timer debugging is on
  PIM Join/Prune PPT timer debugging is on
  PIM Join/Prune KAT timer debugging is on
  PIM Join/Prune OT timer debugging is on
  PIM Assert AT timer debugging is on
  PIM Register RST timer debugging is on
  PIM Bootstrap BST timer debugging is on
  PIM Bootstrap CRP timer debugging is on
```

Related commands [debug ipv6 pim sparse-mode](#)
[undebug ipv6 pim sparse-mode](#)

show ipv6 pim sparse-mode bsr-router

Overview Use this command to show the PIM-SMv6 Bootstrap Router (BSR) IPv6 address.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode bsr-router

Mode User Exec and Privileged Exec

Example To display the BSR IPv6 address, use the command:

```
awplus# show ipv6 pim sparse-mode bsr-router
```

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode bsr-router command

```
awplus#show ipv6 pim sparse-mode bsr-router
PIM6v2 Bootstrap information
BSR address: 2001:203::213 (?)
Uptime:      00:36:25, BSR Priority: 64, Hash mask length: 126
Expires:     00:01:46
Role: Candidate BSR
State: Candidate BSR

Candidate RP: 2001:5::211(vlan5)
Advertisement interval 60 seconds
Next C-RP advertisement in 00:00:43
```

Related commands [show ipv6 pim sparse-mode rp mapping](#)
[show ipv6 pim sparse-mode neighbor](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode interface

Overview Use this command to show PIM-SMv6 interface information.
For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax `show ipv6 pim sparse-mode interface [detail]`

Parameter	Description
detail	Show detailed information.

Mode User Exec and Privileged Exec

Examples To display information about all PIM-SMv6 interfaces, use the command:
`awplus# show ipv6 pim sparse-mode interface`

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode interface command

```
awplus#show ipv6 pim sparse-mode interface
Interface VIFindex Ver/   Nbr   DR
          Mode   Count Priority
vlan2      0      v2/S   2      1
  Address   : fe80::207:e9ff:fe02:81d
  Global Address: 3ffe:192:168:1::53
  DR        : fe80::20e:cff:fe01:facc
vlan3      2      v2/S   2      1
  Address   : fe80::207:e9ff:fe02:21a2
  Global Address: 3ffe:192:168:10::53
  DR        : this system
```

Parameters in the output from the show ipv6 pim sparse-mode interface command

Parameters	Description
Address	Primary PIM-SMv6 address.
Interface	Name of the PIM-SMv6 interface.
VIF Index	The Virtual Interface index of the interface.
Ver/Mode	PIMv6 version/Sparse mode.
Nbr Count	Neighbor count of the PIM-SMv6 interface.
DR Priority	Designated Router priority.
DR	The IPv6 address of the Designated Router.

Related commands [ipv6 pim sparse-mode](#)
[show ipv6 pim sparse-mode rp mapping](#)
[show ipv6 pim sparse-mode neighbor](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode interface detail

Overview Use this command to show detailed PIM-SMv6 information for all PIM-SMv6 configured interfaces.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode interface detail

Mode User Exec and Privileged Exec

Example To show detailed PIM-SMv6 information for all PIM-SMv6 configured interfaces, use the command:

```
awplus# show ipv6 pim sparse-mode interface detail
```

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode interface detail command

```
awplus#show ipv6 pim sparse-mode interface detail
vlan2 (vif 0)
  Address fe80::207:e9ff:fe02:81d, DR fe80::20e:cff:fe01:facc
  Hello period 30 seconds, Next Hello in 21 seconds
  Triggered Hello period 5 seconds
  Secondary addresses:
    3ffe:192:168:1::53
  Neighbors:
    fe80::202:b3ff:fed4:69fe
    fe80::20e:cff:fe01:facc

vlan3 (vif 2):
  Address fe80::207:e9ff:fe02:21a2, DR fe80::207:e9ff:fe02:21a2
  Hello period 30 seconds, Next Hello in 20 seconds
  Triggered Hello period 5 seconds
  Secondary addresses:
    3ffe:192:168:10::53
  Neighbors:
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode local-members

Overview Use this command to show detailed local member information on an interface configured for PIM-SMv6. If you do not specify an interface then detailed local member information is shown for all interfaces configured for PIM-SMv6.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode local-members [<interface>]

Parameter	Description
<interface>	An interface to display information about.

Mode User Exec and Privileged Exec

Example To show detailed PIM-SMv6 information for all PIM-SMv6 configured interfaces, use the command:

```
awplus# show ipv6 pim sparse-mode local-members
```

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode local-members command

```
awplus#show ipv6 pim sparse-mode local-members
PIM Local membership information

vlan1:

  (*, ff02::1:ff6b:4783) : Include

vlan203:

  (*, ff0e:1::4) : Include
```

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode local-members vlan1 command

```
awplus#show ipv6 pim sparse-mode local-members vlan1
PIM Local membership information

vlan1:

(*, ff02::1:ff6b:4783) : Include
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode mroute

Overview Use this command to display the IPv6 multicast routing table, or the IPv6 multicast routing table based on the specified IPv6 address or addresses.

Two group IPv6 addresses cannot be entered simultaneously; two source IPv6 addresses cannot be entered simultaneously.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode mroute
show ipv6 pim sparse-mode mroute <group-IPv6-address>
show ipv6 pim sparse-mode mroute <source-IPv6-address>
show ipv6 pim sparse-mode mroute <group-IPv6-address> <source-IPv6-address>
show ipv6 pim sparse-mode mroute <source-IPv6-address> <group-IPv6-address>
show ipv6 pim sparse-mode mroute brief

Parameter	Description
<group-IPv6-address>	Group IPv6 address, entered in the form X:X::X:X. Based on the group and source IPv6 address, the output is the selected route if present in the multicast route tree.
<source-IPv6-address>	Source IPv6 address, entered in the form X:X::X:X. Based on the source and group IPv6 address, the output is the selected route if present in the multicast route tree.
brief	Brief display.

Mode User Exec and Privileged Exec

Usage notes Note that when a feature license is enabled, the output for the **show ipv6 pim sparse-mode mroute** command will only show 100 interfaces because of the terminal display width limit. Use the **show ipv6 pim sparse-mode mroute detail** command to display detailed entries of the IPv6 multicast routing table.

Examples awplus# show ipv6 pim sparse-mode mroute
awplus# show ipv6 pim sparse-mode mroute 2001:db8::
awplus# show ipv6 pim sparse-mode mroute 2001:db8:: 2002:db8::
awplus# show ipv6 pim sparse-mode mroute brief

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode mroute command

```
awplus#show ipv6 pim sparse-mode mroute
IPv6 Multicast Routing Table

(*,*,RP) Entries: 0(*,G) Entries: 0
(S,G) Entries: 2
(S,G,rpt) Entries: 2
FCR Entries: 0(2001:db8:ffff::1, ff08::1)
RPF nbr: fe80::b:10:0:1
RPF idx: vlan10
SPT bit: 1
Upstream State: JOINED
  Local          0
  Joined         1
  Asserted Winner 0
  Asserted Loser  0
  Outgoing       1(2001:db8:ffff::1, ff08::1, rpt)
RP: ::
RPF nbr: fe80::b:10:0:1
RPF idx: vlan10
Upstream State: RPT NOT JOINED
  Local          0
  Pruned         0
  Outgoing       0(2001:db8:ffff::1, ff08::2)
RPF nbr: fe80::b:10:0:1
RPF idx: vlan10
SPT bit: 1
Upstream State: JOINED
  Local          0
  Joined         1
  Asserted Winner 0
  Asserted Loser  0
  Outgoing       1
```

Example output from the show ipv6 pim sparse-mode mroute brief command

```
awplus#show ipv6 pim sparse-mode mroute brief
IPv6 Multicast Routing Table

(*,*,RP) Entries: 0
(*,G) Entries: 0
(S,G) Entries: 2
(S,G,rpt) Entries: 2
FCR Entries: 0
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode mroute detail

Overview Use this command to display detailed entries of the IPv6 multicast routing table, or detailed entries of the IPv6 multicast routing table based on the specified IPv6 address or addresses.

Two group IPv6 addresses cannot be used simultaneously; two IPv6 source addresses cannot be used simultaneously.

For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax `show ipv6 pim sparse-mode mroute [<group-IPv6-address>|<source-IPv6-address>] detail`
`show ipv6 pim sparse-mode mroute [<group-IPv6-address> <source-IPv6-address>] detail`
`show ipv6 pim sparse-mode mroute [<source-IPv6-address> <group-IPv6-address>] detail`

Parameter	Description
<code><group-IPv6-address></code>	Group IPv6 address, entered in the form X:X::X:X. Output is all multicast entries belonging to that group.
<code><source-IPv6-address></code>	Source IPv6 address, entered in the form X:X::X:X. Output is all multicast entries belonging to that source.
<code>detail</code>	Show detailed information.

Mode User Exec and Privileged Exec

Usage notes Based on the group and source IPv6 address, the output is the selected route if present in the multicast route tree.

Examples `awplus# show ipv6 pim sparse-mode mroute detail`
`awplus# show ipv6 pim sparse-mode mroute 2001:db8:: detail`
`awplus# show ipv6 pim sparse-mode mroute 2001:db8:: 2002:db8:: detail`

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode mroute detail command

```
awplus#show ipv6 pim sparse-mode mroute detail
IPv6 Multicast Routing Table

(*,*,RP) Entries: 0
(*,G) Entries: 1
(S,G) Entries: 0
(S,G,rpt) Entries: 0
FCR Entries: 0

(*, ff13::10) Uptime: 00:00:09
RP: ::, RPF nbr: None, RPF idx: None
Upstream:
  State: JOINED, SPT Switch: Enabled, JT: off
  Macro state: Join Desired,
Downstream:
  vlan2:
    State: NO INFO, ET: off, PPT: off
    Assert State: NO INFO, AT: off
    Winner: ::, Metric: 4294967295l, Pref: 4294967295l, RPT bit: on
    Macro state: Could Assert, Assert Track
Local Olist:
  vlan3
FCR:
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode neighbor

Overview Use this command to show the PIM-SMv6 neighbor information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode neighbor [<interface>] [<IPv6-address>] [detail]

Parameter	Description
<interface>	Interface name. Show neighbors on an interface.
<IPv6-address>	Show neighbors with a particular address on an interface. The IPv6 address entered in the form X:X::X:X.
detail	Show detailed information.

Mode User Exec and Privileged Exec

Examples awplus# show ipv6 pim sparse-mode neighbor
awplus# show ipv6 pim sparse-mode neighbor vlan5 detail

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode neighbor command

```
awplus#show ipv6 pim sparse-mode neighbor
Neighbor Address      Interface    Uptime/Expires      DR
                                Pri/Mode
fe80::202:b3ff:fed4:69fe    vlan2       05:33:52/00:01:41 1 /
fe80::20e:cff:fe01:facc     vlan3       05:33:53/00:01:26 1 / DR
```

Example output from the show ipv6 pim sparse-mode neighbor interface detail command

```
awplus#show ipv6 pim sparse-mode neighbor detail
Nbr fe80::211:11ff:fe44:4cd8 (vlan1), DR
Expires in 64 seconds, uptime 00:00:53
Holdtime: 70 secs, T-bit: off, Lan delay: 1, Override interval: 3
DR priority: 100, Gen ID: 1080091886,
Secondary addresses:
3ffe:10:10:10:3::180
```

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode nexthop

Overview Use this command to see the next hop information as used by PIM-SMv6. For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode nexthop

Mode User Exec and Privileged Exec

Example awplus# show ipv6 pim sparse-mode nexthop

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode nexthop command

awplus#show ipv6 pim sparse-mode nexthop								
Flags: N = New, R = RP, S = Source, U = Unreachable								
Destination	Type	Nexthop Num	Nexthop Addr	Nexthop Ifindex	Nexthop Name	Metric	Pref	Refcnt
3ffe:10:10:5::153	.RS.	1	fe80::20e:cff:fe01:facc	2	30	110	1	

Parameters in output of the show ipv6 pim sparse-mode nexthop command

Parameter	Description
Destination	The destination address for which PIM-SMv6 requires next hop information.
Type	The type of destination, as indicated by the Flags description. N = New, R= RP, S = Source, U = Unreachable.
Nexthop Num	The number of next hops to the destination. PIM-SMv6 always uses only 1 next hop.
Nexthop Addr	The address of the primary next hop gateway.
Nexthop IfIndex	The interface on which the next hop gateway can be reached.
Nexthop Name	The name of next hop interface.
Metric	The metric of the route towards the destination.
Preference	The preference of the route towards destination.
Refcnt	Only used for debugging.

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode rp-hash

Overview Use this command to display the Rendezvous Point (RP) to be chosen based on the IPv6 group address selected.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 pim sparse-mode rp-hash <IPv6-group-addr>

Parameter	Description
<IPv6-group-addr>	The IPv6 group address used to find the RP, entered in the form X:X::X:X.

Mode User Exec and Privileged Exec

Example awplus# show ipv6 pim sparse-mode rp-hash ff04:10

Output The following shows typical output.

Output from the show ipv6 pim sparse-mode rp-hash command:

```
awplus#show ipv6 pim sparse-mode rp-hash ff04::10
RP: 3ffe:10:10:5::153
Info source: 3ffe:10:10:5::153, via bootstrap
```

Related commands [show ipv6 pim sparse-mode rp mapping](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode rp mapping

Overview Use this command to show group-to-RP (Rendezvous Point) mappings, and the RP set.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode rp mapping

Mode User Exec and Privileged Exec

Example awplus# show ipv6 pim sparse-mode rp mapping

Output The following shows typical output.

Output from the show ipv6 pim sparse-mode rp mapping command

```
awplus#show ipv6 pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): ff00::/8
  RP: 3ffe:10:10:5::153
    Info source: 3ffe:10:10:5::153, via bootstrap, priority 192
    Uptime: 05:36:40
```

Related commands [show ipv6 pim sparse-mode rp-hash](#)

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

show ipv6 pim sparse-mode rp nexthop

Overview Use this command to display the RP (Rendezvous Point) next hop information used by PIM-SMv6.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ipv6 pim sparse-mode rp nexthop *<RP-group-addr>*

Parameter	Description
<i><RP-group-addr></i>	Specify the RP group address used to display next hop RP information, entered in the form X:X::X:X.

Mode User Exec and Privileged Exec

Example awplus# show ipv6 pim sparse-mode rp nexthop 3ffe:10:10:5::153

Output The following shows typical output.

Example output from the show ipv6 pim sparse-mode rp nexthop command

awplus#show ipv6 pim sparse-mode rp nexthop 3ffe:10:10:5::153								
Flags: N = New, R = RP, S = Source, U = Unreachable								
Destination	Type	Nexthop Num	Nexthop Addr	Nexthop Ifindex	Nexthop Name	Metric	Pref	Refcnt
3ffe:10:10:5::153	.RS.	1	fe80::20e:cff:fe01:facc	2	30	110	1	

Parameters in output of the show ipv6 pim sparse-mode rp nexthop command

Parameter	Description
Destination	The destination address for which PIM-SMv6 requires next hop information.
Type	The type of destination, as indicated by the Flags description. N = New, R= RP, S = Source, U = Unreachable.
Nexthop Num	The number of next hops to the destination. PIM-SMv6 always uses only 1 next hop.
Nexthop Addr	The address of the primary next hop gateway.
Nexthop IfIndex	The interface on which the next hop gateway can be reached.
Nexthop Name	The name of next hop interface.
Metric	The metric of the route towards the destination.
Preference	The preference of the route towards destination.
Refcnt	Only used for debugging.

Command changes Version 5.5.4-2.3: VRF-lite support added for x530, x530L, x540L, x930, x950, SBx8100, SBx908 GEN2

undebug all ipv6 pim sparse-mode

Overview Use this command to disable all PIM-SMv6 debugging.

Syntax undebug all ipv6 pim sparse-mode

Mode Privileged Exec

Example awplus# undebug all ipv6 pim sparse-mode

Related commands [debug ipv6 pim sparse-mode](#)

undebg ipv6 pim sparse-mode

Overview Use this command to deactivate PIM-SMv6 debugging. Note that this command is an alias of the no variant of the **debug ipv6 pim sparse-mode** command.

Syntax undebg ipv6 pim sparse-mode [all] [events] [mfc] [mib]
[nexthop] [nsm] [state] [timer]

Parameter	Description
all	Deactivates all PIM-SMv6 debugging.
events	Deactivates debug printing of PIM-SMv6 events.
mfc	Deactivates debug printing of MFC (Multicast Forwarding Cache).
mib	Deactivates debug printing of PIM-SMv6 MIBs.
nexthop	Deactivates debug printing of PIM-SMv6 next hop communications.
nsm	Deactivates debugging of PIM-SMv6 NSM (Network Services Module) communications.
state	Deactivates debug printing of state transition on all PIM-SMv6 FSMs.
timer	Deactivates debug printing of PIM-SMv6 timers.

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# undebg ipv6 pim sparse-mode all
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# undebg ipv6 pim sparse-mode events
awplus# configure terminal
awplus(config)# terminal monitor
awplus(config)# undebg ipv6 pim sparse-mode nexthop

Validation Output **Example output from the show debugging ipv6 pim sparse-mode command after issuing the undebug ipv6 pim sparse-mode all command**

```
awplus#undebug ipv6 pim sparse-mode all
awplus#show debugging ipv6 pim sparse-mode
PIM-SMv6 debugging status:
PIM event debugging is off
PIM MFC debugging is off
PIM state debugging is off
PIM packet debugging is off
PIM Hello HT timer debugging is off
PIM Hello NLT timer debugging is off
PIM Hello THT timer debugging is off
PIM Join/Prune JT timer debugging is off
PIM Join/Prune ET timer debugging is off
PIM Join/Prune PPT timer debugging is off
PIM Join/Prune KAT timer debugging is off
PIM Join/Prune OT timer debugging is off
PIM Assert AT timer debugging is off
PIM Register RST timer debugging is off
PIM Bootstrap BST timer debugging is off
PIM Bootstrap CRP timer debugging is off
PIM mib debugging is off
PIM nsm debugging is off
PIM nexthop debugging is off
```

Related commands **debug ipv6 pim sparse-mode**
show debugging ipv6 pim sparse-mode
undebug all ipv6 pim sparse-mode

35

PIM-DM Commands

- Contents**
- **Introduction** on page 1723
 - **debug pim dense-mode all** on page 1724
 - **debug pim dense-mode context** on page 1725
 - **debug pim dense-mode decode** on page 1726
 - **debug pim dense-mode encode** on page 1727
 - **debug pim dense-mode fsm** on page 1728
 - **debug pim dense-mode mrt** on page 1729
 - **debug pim dense-mode nexthop** on page 1730
 - **debug pim dense-mode nsm** on page 1731
 - **debug pim dense-mode vif** on page 1732
 - **ip pim dense-mode** on page 1733
 - **ip pim dense-mode passive** on page 1734
 - **ip pim dense-mode wrong-vif-suppression** on page 1735
 - **ip pim ext-srcs-directly-connected** on page 1736
 - **ip pim hello-holdtime (PIM-DM)** on page 1737
 - **ip pim hello-interval (PIM-DM)** on page 1738
 - **ip pim max-graft-retries** on page 1739
 - **ip pim neighbor-filter (PIM-DM)** on page 1741
 - **ip pim propagation-delay** on page 1742
 - **ip pim state-refresh origination-interval** on page 1743
 - **service pdm** on page 1744
 - **show debugging pim dense-mode** on page 1745
 - **show ip pim dense-mode interface** on page 1746
 - **show ip pim dense-mode interface detail** on page 1748
 - **show ip pim dense-mode mroute** on page 1749
 - **show ip pim dense-mode neighbor** on page 1750
 - **show ip pim dense-mode neighbor detail** on page 1751
 - **show ip pim dense-mode nexthop** on page 1752
 - **undebg all pim dense-mode** on page 1753

Introduction

Overview

This chapter provides an alphabetical reference of PIM-DM commands. For commands common to PIM-SM and PIM-DM, see [Multicast Commands](#).

debug pim dense-mode all

Overview This command enables PIM-DM debugging.
The **no** variant of this command disables PIM-DM debugging.

Syntax debug pim dense-mode all
no debug pim dense-mode all

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode all

Output The following shows typical output.

Example output from the debug pim dense-mode all command

```
PIM event debugging is on
PIM MFC debugging is on
PIM state debugging is on
PIM packet debugging is on
PIM incoming packet debugging is on
PIM outgoing packet debugging is on
```

Related commands

- [debug pim dense-mode context](#)
- [debug pim dense-mode decode](#)
- [debug pim dense-mode encode](#)
- [debug pim dense-mode fsm](#)
- [debug pim dense-mode mrt](#)
- [debug pim dense-mode nexthop](#)
- [debug pim dense-mode nsm](#)
- [debug pim dense-mode vif](#)
- [show debugging pim dense-mode](#)

debug pim dense-mode context

Overview This command enables debugging of general configuration context. The **no** variant of this command disables debugging of general configuration context.

Syntax debug pim dense-mode context
no debug pim dense-mode context

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode context

Related commands

- debug pim dense-mode all**
- debug pim dense-mode decode**
- debug pim dense-mode encode**
- debug pim dense-mode fsm**
- debug pim dense-mode mrt**
- debug pim dense-mode nexthop**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

debug pim dense-mode decode

Overview This command enables debugging of the PIM-DM message decoder. The **no** variant of this command disables debugging of the PIM-DM message decoder.

Syntax debug pim dense-mode decode
no debug pim dense-mode decode

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode decoder

Related commands

- debug pim dense-mode all
- debug pim dense-mode context
- debug pim dense-mode encode
- debug pim dense-mode fsm
- debug pim dense-mode mrt
- debug pim dense-mode nexthop
- debug pim dense-mode nsm
- debug pim dense-mode vif

debug pim dense-mode encode

Overview This command enables debugging of the PIM-DM message encoder. The **no** variant of this command disables debugging of the PIM-DM message encoder.

Syntax debug pim dense-mode encode
no debug pim dense-mode encode

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode encoder

Related commands

- debug pim dense-mode all**
- debug pim dense-mode context**
- debug pim dense-mode decode**
- debug pim dense-mode fsm**
- debug pim dense-mode mrt**
- debug pim dense-mode nexthop**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

debug pim dense-mode fsm

Overview This command enables debugging of Finite-State Machine (FSM) specific information of all Multicast Routing Table (MRT) and MRT Virtual Multicast Interface (MRT-VIF) entries.

The **no** variant of this command disables debugging of Finite-State Machine (FSM) specific information of all Multicast Routing Table (MRT) and MRT Virtual Multicast Interface (MRT-VIF) entries.

Syntax debug pim dense-mode fsm
no debug pim dense-mode fsm

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode fsm

Related commands

- debug pim dense-mode all**
- debug pim dense-mode context**
- debug pim dense-mode decode**
- debug pim dense-mode encode**
- debug pim dense-mode mrt**
- debug pim dense-mode nexthop**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

debug pim dense-mode mrt

Overview This command enables debugging of MRT and MRT-VIF entry handling (for example, creation and deletion of).

The **no** variant of this command disables debugging of MRT and MRT-VIF entry handling.

Syntax debug pim dense-mode mrt
no debug pim dense-mode mrt

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode mrt

Related commands

- debug pim dense-mode all**
- debug pim dense-mode context**
- debug pim dense-mode decode**
- debug pim dense-mode encode**
- debug pim dense-mode fsm**
- debug pim dense-mode nexthop**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

debug pim dense-mode nexthop

Overview This command enables debugging of Reverse Path Forwarding (RPF) neighbor next hop cache handling.

The **no** variant of this command disables debugging of Reverse Path Forwarding (RPF) neighbor next hop cache handling.

Syntax debug pim dense-mode nexthop
no debug pim dense-mode nexthop

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode nexthop

Related commands

- debug pim dense-mode all**
- debug pim dense-mode context**
- debug pim dense-mode decode**
- debug pim dense-mode encode**
- debug pim dense-mode fsm**
- debug pim dense-mode mrt**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

debug pim dense-mode nsm

Overview This command enables debugging of PIM-DM interface with NSM.
The **no** variant of this command disables debugging of PIM-DM interface with NSM.

Syntax debug pim dense-mode nsm
no debug pim dense-mode nsm

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode nsm

Related commands

- debug pim dense-mode all
- debug pim dense-mode context
- debug pim dense-mode decode
- debug pim dense-mode encode
- debug pim dense-mode fsm
- debug pim dense-mode mrt
- debug pim dense-mode nexthop
- debug pim dense-mode vif

debug pim dense-mode vif

Overview This command enables debugging of VIF handling.
The **no** variant of this command disables debugging of VIF handling.

Syntax debug pim dense-mode vif
no debug pim dense-mode vif

Mode Privileged Exec and Global Configuration

Example awplus# configure terminal
awplus(config)# debug pim dense-mode vif

Related commands

- debug pim dense-mode all
- debug pim dense-mode context
- debug pim dense-mode decode
- debug pim dense-mode encode
- debug pim dense-mode fsm
- debug pim dense-mode mrt
- debug pim dense-mode nexthop
- debug pim dense-mode nsm

ip pim dense-mode

Overview This command enables or disables PIM-DM operation from Interface mode on the current VLAN interface. This command also disables passive mode on the VLAN interface if passive mode has been enabled using an **ip pim dense-mode passive** command.

The **no** variant of this command disables all PIM-DM activities on the interface.

Syntax ip pim dense-mode
no ip pim dense-mode

Mode Interface Configuration for a VLAN interface.

Example awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim dense-mode

ip pim dense-mode passive

Overview This command enables PIM-DM passive mode operation from Interface mode on the current VLAN interface.

The **no** variant of this command disables passive mode.

Syntax ip pim dense-mode passive
no ip pim dense-mode passive

Mode Interface Configuration for a VLAN interface.

Usage Configuring a VLAN interface as a passive PIM-DM interface indicates that the VLAN interface is connected to a stub network (i.e. a network that does not contain any PIM Routers). So, multicast streams that arrive on other PIM-DM interfaces can be routed to hosts on the passive PIM-DM interface, but no PIM neighbor relationships will be formed on the passive PIM-DM interface.

Example awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim dense-mode passive

ip pim dense-mode wrong-vif-suppression

Overview Use this command to permit or block packets that arrive on the wrong VLAN Interface (VIF) for PIM dense-mode.

Use the **no** variant of this command to disable dense-mode wrong VIF suppression

Syntax ip pim dense-mode wrong-vif-suppression
no ip pim dense-mode wrong-vif-suppression

Default Disabled.

Mode Global Configuration

Usage notes This command enables wrong VIF suppression for PIM dense-mode. Wrong VIF suppression prevents multicast packets received on the wrong upstream interface from being copied to the CPU.

Examples To enable wrong VIF suppression, use the commands:

```
awplus# configure terminal  
awplus(config)# ip pim dense-mode wrong-vif-suppression
```

To disable wrong VIF suppression, use the commands:

```
awplus# configure terminal  
awplus(config)# no ip pim dense-mode wrong-vif-suppression
```

Command changes Version 5.4.8-2.3: command added.

ip pim ext-srcs-directly-connected

Overview Use this command to configure PIM to treat all source traffic arriving on the interface as though it was sent from a host directly connected to the interface.

Use the **no** variant of this command to configure PIM to treat only directly connected sources as directly connected.

Syntax `ip pim ext-srcs-directly-connected`
`no ip pim ext-srcs-directly-connected`

Default The **no** variant of this command is the default behavior.

Mode Interface Configuration for a VLAN interface.

Example To configure PIM to treat all sources as directly connected for VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim ext-srcs-directly-connected
```

To configure PIM to treat only directly connected sources as directly connected for VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim ext-srcs-directly-connected
```

ip pim hello-holdtime (PIM-DM)

Overview This command configures a **hello-holdtime**. The PIM **hello-holdtime** on a VLAN interface is the period which the router will wait to receive a hello from neighbors on that interface. If the router does not receive a hello from a given neighbor within that period, then it will decide that the neighbor is no longer an active PIM Router, and will terminate the neighbor relationship.

You cannot configure a **hello-holdtime** value that is less than the current **hello-interval**. Each time the **hello-interval** is updated, the **hello-holdtime** is also updated, according to the following rules:

- If the **hello-holdtime** is not configured; or if the hello holdtime is configured and less than the current **hello-interval** value, it is modified to 3.5 times the **hello-interval** value.
- Otherwise, it retains the configured value.

Use the **no** variant of this command to return the hello-holdtime value to its default of 3.5 times the current hello-interval value.

Syntax `ip pim hello-holdtime <holdtime>`
`no ip pim hello-holdtime`

Parameter	Description
<code><holdtime></code>	<code><1-65535></code> The holdtime value in seconds (no fractional seconds are accepted).

Mode Interface Configuration for a VLAN interface.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim hello-holdtime 123`

ip pim hello-interval (PIM-DM)

Overview This command configures a PIM **hello-interval** value. The PIM **hello-interval** on a VLAN interface is the period at which the router will transmit PIM hello messages on that interface.

When the **hello-interval** is configured, and the **hello-holdtime** is not configured, or when the configured **hello-holdtime** value is less than the new **hello-interval** value; the **hello-holdtime** value is modified to 3.5 times the **hello-interval** value. Otherwise, the **hello-holdtime** value is the configured value. The default is 30 seconds.

Use the **no** variant of this command to reset the **hello-interval** to the default. JC - 4/4/12 - CR33756 - extended and added mode and example for use on a PPP interface.

Syntax `ip pim hello-interval <interval>`
`no ip pim hello-interval`

Parameter	Description
<code><interval></code>	<code><1-65535></code> The value in seconds (no fractional seconds accepted).

Mode Interface Configuration for a VLAN interface.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim hello-interval 123`

ip pim max-graft-retries

Overview This command configures PIM-DM to send a limited number of Graft message retries, after which time the device will remove all information regarding the particular (Source, Group), or until the device receives an acknowledgment, whichever occurs first.

The **no** variant of this command configures PIM-DM to send Graft message retries until the device receives an acknowledgment, which is the default behavior.

Syntax `ip pim max-graft-retries <1-65535>`
`no pim max-graft-retries`

Parameter	Description
no	Negate a command or set its defaults.
ip	Internet Protocol (IP).
pim	PIM Interface commands.
max-graft-retries	PIM Graft message retries.
<1-65535>	Graft message retries before ceasing Graft message retries.

Default By default, Graft retries are sent by PIM-DM until the device receives an acknowledgment.

Mode Interface Configuration for a VLAN interface.

Usage Graft messages are used to reduce the join latency when a previously pruned branch of the source tree must be grafted back, when a member joins the group after the PIM-DM device has sent a Prune message to prune unwanted traffic. Graft messages are the only PIM-DM messages that receive an acknowledgment.

If Graft messages were not used, then the member waiting for pruned off traffic would have to wait up to 3 minutes for the periodic re-flooding to occur to begin receiving multicast traffic again. By using Grafts, the Prune can be reversed much faster than waiting for periodic re-flooding to begin receiving multicast traffic again.

Examples To configure PIM-DM on the VLAN interface vlan2 to send a maximum of 10 Graft message retries, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip pim max-graft-retries 10
```

To configure PIM-DM on the VLAN interface vlan2 to send Graft message retries forever, which is the default behavior, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip pim max-graft-retries
```

Related Commands [show ip mroute](#)
[show ip pim dense-mode mroute](#)
[show running-config](#)

ip pim neighbor-filter (PIM-DM)

Overview Enables filtering of neighbors on the VLAN interface. When configuring a neighbor filter, PIM-DM will either not establish adjacency with the neighbor, or terminate adjacency with the existing neighbors if denied by the filtering access list.

Use the **no** variant of this command to disable this function.

Syntax `ip pim neighbor-filter [<number>|<accesslist>]`
`no ip pim neighbor-filter [<number>|<accesslist>]`

Parameter	Description
<number>	<1-99> Standard IP access list number.
<accesslist>	IP access list name.

Default By default, there is no filtering.

Mode Interface Configuration for a VLAN interface.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim neighbor-filter 14`

ip pim propagation-delay

Overview This command configures the PIM **propagation-delay** value. The PIM **propagation-delay** is the expected delay in the transfer of PIM messages across the VLAN interface that it is attached to.

Use the **no** variant of this command to return the **propagation-delay** to the default (1000 milliseconds).

Syntax `ip pim propagation-delay <delay>`
`no ip pim propagation-delay`

Parameter	Description
<code><delay></code>	<code><1000-5000></code> The value in milliseconds. The default is 1000 milliseconds.

Default The propagation-delay is set to 1000 milliseconds by default.

Interface Configuration for a VLAN interface.

Examples `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim propagation-delay 2000`
`awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# no ip pim propagation-delay`

ip pim state-refresh origination-interval

Overview This command configures a PIM **state-refresh origination-interval** value. The origination interval is the number of seconds between PIM state refresh control messages. The default is 60 seconds.

Use the **no** variant of this command to return the origination interval to the default.

Syntax `ip pim state-refresh origination-interval <interval>`
`no ip pim state-refresh origination-interval`

Parameter	Description
<code><interval></code>	<code><1-100></code> The integer value in seconds (no fractional seconds accepted). The default state-refresh origination-interval value is 60.

Default The state-refresh origination-interval is set to 60 seconds by default, and is reset using negation.

Mode Interface Configuration for a VLAN interface.

Example `awplus# configure terminal`
`awplus(config)# interface vlan2`
`awplus(config-if)# ip pim state-refresh origination-interval 65`

service pdm

Overview Use this command to enable the PIM Dense Mode service.

Use the **no** version of the command to disable the PIM Dense Mode service if you are not using it.

Syntax service pdm
no service pdm

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that are not using PIM. Enable it before configuring PIM-DM.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Example To enable the PIM Dense Mode service, use the commands:

```
awplus# configure terminal
awplus(config)# service pdm
```

To disable the service, use the commands:

```
awplus# configure terminal
awplus(config)# no service pdm
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: default changed to disabled
Version 5.5.0-0.1: command added

show debugging pim dense-mode

Overview This command displays the status of the debugging of the system.
For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show debugging pim dense-mode

Mode User Exec and Privileged Exec

Output The following shows typical output.

Example output from the show debugging pim dense-mode command

```
PIM-DM Debugging status:
PIM-DM Decoder debugging is off
PIM-DM Encoder debugging is off
PIM-DM FSM debugging is off
PIM-DM MRT debugging is off
PIM-DM NHOP debugging is off
PIM-DM NSM debugging is off
PIM-DM VIF debugging is off
```

Related commands [debug pim dense-mode all](#)

show ip pim dense-mode interface

Overview This command displays the PIM-DM interface information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim dense-mode interface

Mode User Exec and Privileged Exec

Example To display information about the PIM-DM interfaces, use the command:

```
awplus# show ip pim dense-mode interface
```

Output

```
Total configured interfaces: 24    Maximum allowed: 32
Total active interfaces:      22

Address          Interface VIFIndex Ver/  Nbr
                  Mode      Count
192.168.1.53/24  vlan2    0       v2/D  2
192.168.2.1     vlan3    2       v2/D  0
...
Note that this screen has been edited to remove any additional
interfaces.
```

Parameters in the output of the show ip pim dense-mode interface command

Parameter	Description
Total configured interfaces	The number of configured PIM Dense Mode interfaces.
Maximum allowed	The maximum number of PIM Dense Mode interfaces that can be configured.
Total active interfaces	The number of active PIM Dense Mode interfaces.
Address	Primary PIM-DM address.
Interface	Name of the PIM-DM interface.
VIF Index	The Virtual Interface index of the VLAN.
Ver/Mode	PIM version/Dense mode.
Nbr Count	Neighbor count of the PIM-DM interface.

Related **ip pim dense-mode**
commands **show ip pim dense-mode neighbor**

show ip pim dense-mode interface detail

Overview This command displays detailed information on a PIM-DM interface.
For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip pim dense-mode interface detail

Mode User Exec and Privileged Exec

Example awplus# show ip pim dense-mode interface detail

Output The following shows typical output.

Example output from the show ip pim dense-mode interface detail command

```
vlan2 (vif-id: 0):  
Address 192.168.1.53/24  
Hello period 30 seconds, Next Hello in 30 seconds  
  
Neighbors:  
192.168.1.152/32  
192.168.1.149/32  
vlan3 (vif-id: 2):  
Address 192.168.10.53/24  
Hello period 30 seconds, Next Hello in 8 seconds  
Neighbors: none
```


show ip pim dense-mode mroute

Overview Use this command to display the IP PIM-DM multicast routing table. For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip pim dense-mode mroute

Mode User Exec and Privileged Exec

Example awplus# show ip pim dense-mode mroute

Output The following shows typical output.

Example output from the show ip pim dense-mode mroute command

```
PIM-DM Multicast Routing Table
(192.168.10.52, 224.1.1.1)
Source directly connected on vlan3
State-Refresh Originator State: Originator
Upstream IF: vlan3, State: Forwarding
Downstream IF List:
vlan2, in 'olist':
Downstream State: NoInfo
Assert State: NoInfo
```

show ip pim dense-mode neighbor

Overview This command displays PIM-DM neighbor information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim dense-mode neighbor

Mode User Exec and Privileged Exec

Usage notes The total number of PIM-DM neighbors is restricted to 500 PIM-DM neighbors.

When the 500 PIM-DM neighbor limit is reached, as a result of receiving hello packets from new PIM-DM neighbors, a log entry will be issued to the log file in the below format:

```
<date> <time> <facility>.<severity> <program[<pid>]>: <message>
-----
2008 Dec 10 00:58:39 user.err x908 PIM-DM[1150]: [VIF] Nbr
Create: Cannot create more than 500 neighbours - ignoring
neighbour 100.0.1.247/32 on vlan100
```

Example awplus# show ip pim dense-mode neighbor

Output The following shows typical output.

Example output from the show ip pim dense-mode neighbor command

```
Total number of neighbors: 500
Neighbor-Address  Interface      Uptime/Expires  Ver
192.168.1.152     vlan2          17:15:42/00:01:28 v2
192.168.1.149     vlan2          17:15:34/00:01:34 v2
```

show ip pim dense-mode neighbor detail

Overview This command displays detailed PIM-DM neighbor information.
For information on filtering and saving command output, see the [“Getting_Started with AlliedWare Plus” Feature Overview and Configuration_Guide](#).

Syntax show ip pim dense-mode neighbor detail

Mode User Exec and Privileged Exec

Example awplus# show ip pim dense-mode neighbor detail

Output The following shows typical output.

Example output from the show ip pim dense-mode neighbor detail command

```
Neighbor 192.168.1.152 (vlan2)
Up since 17:16:20, Expires in 00:01:20
Neighbor 192.168.1.149 (vlan2)
Up since 17:16:12, Expires in 00:01:26
```

show ip pim dense-mode nexthop

Overview This command displays the next hop information as used by PIM-DM. In the context of PIM-DM, the term 'next hop' refers to the next hop router on the path back to the source address of a multicast stream.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip pim dense-mode nexthop

Mode User Exec and Privileged Exec

Example awplus# show ip pim dense-mode nexthop

Output The following shows typical output.

Example output from the show ip pim dense-mode neighbor nexthop command

Destination	Nexthop Num	Nexthop Addr	Nexthop Interface	Metric	Pref
192.168.10.52	1	0.0.0.0	vlan2	3	1

Parameters in the output of the show ip pim dense-mode neighbor nexthop command

Parameter	Description
Destination	Destination address for which PIM-DM requires next hop information.
Nexthop Num	Number of next hops to the destination. PIM can only use one next hop.
Nexthop Addr	Address of the current next hop gateway.
Nexthop Interface	Name of the next hop interface.
Metric	Metric of the route towards the destination.
Preference	Preference of the route towards the destination.

undebbug all pim dense-mode

Overview Use this command from the Global Configuration mode to disable all PIM-DM debugging.

Syntax undebbug all pim dense-mode

Mode Global Configuration

Example awplus# configure terminal
awplus(config)# undebbug all pim dense-mode

Related commands

- debug pim dense-mode all**
- debug pim dense-mode context**
- debug pim dense-mode decode**
- debug pim dense-mode encode**
- debug pim dense-mode fsm**
- debug pim dense-mode mrt**
- debug pim dense-mode nexthop**
- debug pim dense-mode nsm**
- debug pim dense-mode vif**

36 Multicast Source Discovery Protocol (MSDP) Commands

- Contents**
- **Introduction** on page 1755
 - **clear ip msdp sa-cache** on page 1756
 - **debug msdp** on page 1757
 - **debug msdp timer** on page 1758
 - **ip msdp hold-time** on page 1759
 - **ip msdp keep-alive** on page 1761
 - **ip msdp mesh-group** on page 1763
 - **ip msdp mesh-group member** on page 1765
 - **ip msdp mesh-group member hold-time** on page 1767
 - **ip msdp mesh-group member keep-alive** on page 1769
 - **ip msdp peer** on page 1771
 - **ip msdp peer hold-time** on page 1773
 - **ip msdp peer keep-alive** on page 1775
 - **ip msdp peer rp-filter** on page 1777
 - **ip msdp peer sg-filter** on page 1779
 - **ip msdp sa-cache-timeout** on page 1781
 - **msdp default peer** on page 1782
 - **show debugging msdp** on page 1783
 - **show ip msdp mesh-group** on page 1785
 - **show ip msdp peer** on page 1789
 - **show ip msdp sa-cache** on page 1793

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Multicast Source Discovery Protocol (MSDP).

For more information, see the [Multicast Source Discovery Protocol \(MSDP\) Feature Overview and Configuration Guide](#).

clear ip msdp sa-cache

Overview Use this command to clear all the source-active (SA) messages in the SA-cache. The SA-cache contains multicast SA messages that are being sent to or received from MSDP peers.

Syntax clear ip msdp sa-cache

Mode Privileged Exec

Example To remove all entries in the SA-cache, use the commands:
awplus# clear ip msdp sa-cache

Related commands [show ip msdp sa-cache](#)

Command changes Version 5.5.1-0.1: command added

debug msdp

Overview Use this command to enable debugging for MSDP.
Use the **no** variant of this command to disable debugging for MSDP.

Syntax debug msdp all
debug msdp state
debug msdp packet [in|out]
no debug msdp all
no debug msdp state
no debug msdp packet [in|out]

Parameter	Description
all	Enable all MSDP debugging options.
state	Enable debugging for the MSDP peer state.
packet	Enable debugging for MSDP packets.
in	Enable debugging for incoming MSDP packets.
out	Enable debugging for outgoing MSDP packets.

Default Debugging is disabled.

Mode Global Configuration or Privileged Exec

Example To enable debugging for the MSDP peer state, use the command:
awplus# debug msdp state
To enable debugging for incoming MSDP packets, use the command:
awplus# debug msdp packet in
To disable all MSDP debugging, use the command:
awplus# no debug msdp all

Related commands [debug msdp timer](#)
[show debugging msdp](#)

Command changes Version 5.5.1-0.1: command added

debug msdp timer

Overview Use this command to enable debugging for the specified MSDP timers.
Use the **no** variant of this command to disable debugging for MSDP timers.

Syntax debug msdp timer [connect|hold|keep-alive|sa-advert|sa-state]
no debug msdp timer [connect|hold|keep-alive|sa-advert|sa-state]

Parameter	Description
connect	Debugging for the connect retry timer.
hold	Debugging for the peer hold-time timer.
keep-alive	Debugging for the keep-alive timer.
sa-advert	Debugging for the SA-advertisement timer.
sa-state	Debugging for the SA-cache timer.

Default Debugging is disabled.

Mode Privileged Exec

Example To enable debugging for all timers, use the command:
awplus# debug msdp timer
To enable debugging for the connect retry timer, use the command:
awplus# debug msdp timer connect
To disable debugging for the peer hold-time timer, use the command:
awplus# no debug msdp timer hold

Related commands [debug msdp](#)
[show debugging msdp](#)

Command changes Version 5.5.1-0.1: command added

ip msdp hold-time

Overview Use this command to configure the global MSDP hold-time timeout.

The hold-time timeout defines how long a peer will wait between MSDP messages before dropping the connection. It is important that the hold-time timeout is greater than the keep-alive timeout configured on each peer. The global hold-time will be overridden if a specific hold-time timeout is configured for an individual peer.

Use the **no** variant of this command to reset the hold-time timeout to the default (75 seconds).

Syntax ip msdp hold-time <15-75>
no ip msdp hold-time

Parameter	Description
<15-75>	The hold-time timeout (in seconds).

Default 75 seconds.

Mode Global Configuration

Example To configure the hold-time timeout to 60 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp hold-time 60
```

To reset the hold-time timeout to the default of 75 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp hold-time
```

Related commands

- [ip msdp keep-alive](#)
- [ip msdp mesh-group](#)
- [ip msdp mesh-group member](#)
- [ip msdp mesh-group member hold-time](#)
- [ip msdp mesh-group member keep-alive](#)
- [ip msdp peer](#)
- [ip msdp peer hold-time](#)
- [ip msdp peer keep-alive](#)
- [ip msdp sa-cache-timeout](#)

Command changes Version 5.5.1-0.1: command added

ip msdp keep-alive

Overview Use this command to configure the global MSDP keep-alive timeout.

The keep-alive timeout defines the period between keep-alive messages being sent to each peer. It is important that the keep-alive timeout is less than the hold-time timeout configured on each peer device. The global keep-alive will be overridden if a specific keep-alive timeout is configured for an individual peer.

Use the **no** variant of this command to reset the keep-alive timeout to the default (60 seconds).

Syntax ip msdp keep-alive <10-60>
no ip msdp keep-alive

Parameter	Description
<10-60>	The keep-alive timeout (in seconds).

Default 60 seconds.

Mode Global Configuration

Example To configure the keep-alive timeout to 45 seconds, use the commands:

```
awplus# configure terminal  
awplus(config)# ip msdp keep-alive 45
```

To reset the keep-alive timeout to the default of 60 seconds, use the commands:

```
awplus# configure terminal  
awplus(config)# no ip msdp keep-alive
```

Related commands

- [ip msdp hold-time](#)
- [ip msdp mesh-group](#)
- [ip msdp mesh-group member](#)
- [ip msdp mesh-group member hold-time](#)
- [ip msdp mesh-group member keep-alive](#)
- [ip msdp peer](#)
- [ip msdp peer hold-time](#)
- [ip msdp peer keep-alive](#)
- [ip msdp sa-cache-timeout](#)

Command changes Version 5.5.1-0.1: command added

ip msdp mesh-group

Overview Use this command to create an MSDP mesh-group with an associated local source address.

Use the **no** variant of this command to delete an MSDP mesh-group.

Syntax `ip msdp mesh-group <group-name> local-address <ip-address>`
`no ip msdp mesh-group <group-name>`

Parameter	Description
<code><group-name></code>	The name of the MSDP mesh-group.
<code><ip-address></code>	The IPv4 local address.

Default No mesh-groups are configured.

Mode Global Configuration

Example To create an MSDP mesh-group named 'group' with a local address of 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp mesh-group group local-address
192.168.1.5
```

To delete an MSDP mesh-group named 'group', use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp mesh-group group
```

Related commands

- `ip msdp hold-time`
- `ip msdp keep-alive`
- `ip msdp mesh-group member`
- `ip msdp mesh-group member hold-time`
- `ip msdp mesh-group member keep-alive`
- `ip msdp peer`
- `ip msdp peer hold-time`
- `ip msdp peer keep-alive`
- `ip msdp sa-cache-timeout`
- `show ip msdp mesh-group`
- `show ip msdp peer`

Command changes Version 5.5.1-0.1: command added

ip msdp mesh-group member

Overview Use this command to include an MSDP peer as a member of an MSDP mesh-group. The mesh-group needs to be configured with the **ip msdp mesh-group** command before members can be added.

Use the **no** variant of this command to remove an MSDP peer from an MSDP mesh-group.

Syntax `ip msdp mesh-group <group-name> member <ip-address>`
`no ip msdp mesh-group <group-name> member <ip-address>`

Parameter	Description
<code><group-name></code>	The name of the MSDP mesh-group.
<code><ip-address></code>	The IPv4 address of the peer.

Default Peers are not included in a mesh-group.

Mode Global Configuration

Example To add the peer at 192.168.1.3 to an MSDP mesh-group named 'group', use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp mesh-group group member 192.168.1.3
```

To remove the peer at 192.168.1.3 from an MSDP mesh-group named 'group', use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp mesh-group group member 192.168.1.3
```

Related commands

- ip msdp hold-time**
- ip msdp keep-alive**
- ip msdp mesh-group**
- ip msdp mesh-group member hold-time**
- ip msdp mesh-group member keep-alive**
- ip msdp peer hold-time**
- ip msdp peer keep-alive**
- ip msdp peer**
- ip msdp sa-cache-timeout**
- ip pim sparse-mode**
- show ip msdp peer**
- show ip msdp mesh-group**

Command changes Version 5.5.1-0.1: command added

ip msdp mesh-group member hold-time

Overview Use this command to configure the MSDP hold-time timeout for an MSDP mesh-group member.

The hold-time timeout defines how long a peer will wait between MSDP messages before dropping the connection. It is important that the hold-time timeout is greater than the keep-alive timeout configured on each peer. The global hold-time will be overridden if a specific hold-time timeout is configured for an individual peer.

Use the **no** variant of this command to delete the mesh-group member-specific hold-time timeout.

Syntax `ip msdp mesh-group <group-name> member <ip-address> hold-time <15-75>`
`no ip msdp mesh-group <group-name> member <ip-address> hold-time`

Parameter	Description
<group-name>	The name of a mesh-group.
<ip-address>	The IPv4 address of the mesh-group member.
<15-75>	The hold-time timeout (in seconds).

Default MSDP mesh-group members use the global hold-time timeout (75 seconds by default).

Mode Global Configuration

Example To configure the hold-time timeout for a member of mesh-group 'group' at 192.168.1.5 to 45 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp mesh-group group 192.168.1.5 hold-time 45
```

To delete the specific hold-time timeout configured for the member at 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp mesh-group group 192.168.1.5 hold-time
```

Related commands

- ip msdp hold-time**
- ip msdp keep-alive**
- ip msdp mesh-group**
- ip msdp mesh-group member**
- ip msdp mesh-group member keep-alive**
- ip msdp peer**
- ip msdp peer hold-time**
- ip msdp peer keep-alive**
- ip msdp sa-cache-timeout**

Command changes Version 5.5.1-0.1: command added

ip msdp mesh-group member keep-alive

Overview Use this command to configure the MSDP keep-alive timeout for an MSDP mesh-group member.

The keep-alive timeout defines the period between keep-alive messages being sent to each peer. It is important that the keep-alive timeout is less than the hold-time timeout configured on each peer device. The global keep-alive will be overridden if a specific keep-alive timeout is configured for an individual peer.

Use the **no** variant of this command to delete the mesh-group member-specific keep-alive timeout.

Syntax `ip msdp mesh-group <group-name> member <ip-address> keep-alive <10-60>`
`no ip msdp mesh-group <group-name> member <ip-address> keep-alive`

Parameter	Description
<group-name>	The name of a mesh-group.
<ip-address>	The IPv4 address of the mesh-group member.
<10-60>	The keep-alive timeout (in seconds).

Default MSDP mesh-group members use the global keep-alive timeout (60 seconds by default).

Mode Global Configuration

Example To configure the keep-alive timeout for a member of mesh-group 'group' at 192.168.1.5 to 45 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp mesh-group group 192.168.1.5 keep-alive 45
```

To delete the specific keep-alive timeout configured for the member at 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp mesh-group group 192.168.1.5 keep-alive
```

Related commands

- `ip msdp hold-time`
- `ip msdp keep-alive`
- `ip msdp mesh-group`
- `ip msdp mesh-group member`
- `ip msdp mesh-group member hold-time`
- `ip msdp peer`
- `ip msdp peer hold-time`
- `ip msdp peer keep-alive`
- `ip msdp sa-cache-timeout`

Command changes Version 5.5.1-0.1: command added

ip msdp peer

Overview Use this command to configure a new MSDP peer.
Use the **no** variant of this command to remove an MSDP peer.

Syntax `ip msdp peer <ip-address> local-address <local-address>`
`no ip msdp peer <ip-address> [local-address <local-address>]`

Parameter	Description
<code><ip-address></code>	The IPv4 address of the peer.
<code><local-address></code>	The local IPv4 address to listen and send from.

Default No MSDP peers are configured.

Mode Global Configuration

Example To configure an MSDP peer at 192.168.1.3 with a local address of 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp peer 192.168.1.3 local-address
192.168.1.5
```

Related commands

- `ip msdp hold-time`
- `ip msdp keep-alive`
- `ip msdp mesh-group`
- `ip msdp mesh-group member`
- `ip msdp mesh-group member hold-time`
- `ip msdp mesh-group member keep-alive`
- `ip msdp peer hold-time`
- `ip msdp peer keep-alive`
- `ip msdp peer rp-filter`
- `ip msdp peer sg-filter`
- `ip msdp sa-cache-timeout`
- `ip pim sparse-mode`
- `msdp default peer`
- `show ip msdp peer`
- `show ip msdp sa-cache`

Command changes Version 5.5.1-0.1: command added

ip msdp peer hold-time

Overview Use this command to configure the MSDP hold-time timeout for an MSDP peer.

The hold-time timeout defines how long a peer will wait between MSDP messages before dropping the connection. It is important that the hold-time timeout is greater than the keep-alive timeout configured on each peer. The global hold-time will be overridden if a specific hold-time timeout is configured for an individual peer.

Use the **no** variant of this command to delete the peer-specific hold-time timeout.

Syntax `ip msdp peer <ip-address> hold-time <15-75>`
`no ip msdp peer <ip-address> hold-time`

Parameter	Description
<ip-address>	The IPv4 address of the peer.
<15-75>	The hold-time timeout (in seconds).

Default MSDP peers use the global hold-time timeout (75 seconds by default).

Mode Global Configuration

Example To configure the hold-time timeout for the peer at 192.168.1.5 to 45 seconds, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip msdp peer 192.168.1.5 hold-time 45
```

To delete the specific hold-time timeout configured for the peer at 192.168.1.5, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no ip msdp peer 192.168.1.5 hold-time
```

Related commands

- ip msdp hold-time**
- ip msdp keep-alive**
- ip msdp mesh-group**
- ip msdp mesh-group member**
- ip msdp mesh-group member hold-time**
- ip msdp mesh-group member keep-alive**
- ip msdp peer**
- ip msdp peer keep-alive**
- ip msdp sa-cache-timeout**

Command changes Version 5.5.1-0.1: command added

ip msdp peer keep-alive

Overview Use this command to configure the MSDP keep-alive timeout for an MSDP peer.

The keep-alive timeout defines the period between keep-alive messages being sent to each peer. It is important that the keep-alive timeout is less than the hold-time timeout configured on each peer device. The global keep-alive will be overridden if a specific keep-alive timeout is configured for an individual peer.

Use the **no** variant of this command to delete the peer-specific keep-alive timeout.

Syntax `ip msdp peer <ip-address> keep-alive <10-60>`
`no ip msdp peer <ip-address> keep-alive`

Parameter	Description
<ip-address>	The IPv4 address of the peer.
<10-60>	The keep-alive timeout (in seconds).

Default MSDP peers use the global keep-alive timeout (60 seconds by default).

Mode Global Configuration

Example To configure the keep-alive timeout for the peer at 192.168.1.5 to 45 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp peer 192.168.1.5 keep-alive 45
```

To delete the specific keep-alive timeout configured for the peer at 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp peer 192.168.1.5 keep-alive
```

Related commands

- `ip msdp hold-time`
- `ip msdp keep-alive`
- `ip msdp mesh-group`
- `ip msdp mesh-group member`
- `ip msdp mesh-group member hold-time`
- `ip msdp mesh-group member keep-alive`
- `ip msdp peer`
- `ip msdp peer hold-time`
- `ip msdp sa-cache-timeout`

Command changes Version 5.5.1-0.1: command added

ip msdp peer rp-filter

Overview Use this command to configure filters for incoming and outgoing SA messages for a peer based on the RP address. You can configure filters for a peer to permit or deny SA messages based on the RP addresses. The filters use an access list where the source must match the SA RP address; the destination address is unused.

Use the **no** variant of this command to remove the filters.

Syntax `ip msdp peer <ip-address> rp-filter in {<100-199>|<2000-2699>|<access-list>}`
`ip msdp peer <ip-address> rp-filter out {<100-199>|<2000-2699>|<access-list>}`
`no ip msdp peer <ip-address> rp-filter [in|out]`

Parameter	Description
<ip-address>	The IPv4 address of the peer.
in	The incoming filter.
out	The outgoing filter.
<100-199>	IP extended access list.
<2000-2699>	IP extended access list (expanded range).
<access-list>	Access list name.

Default No RP filters are configured.

Mode Global Configuration

Example To configure an incoming RP filter for 192.168.1.5 using IP extended access list 100, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 100 permit ip 172.16.48.133/32
1.1.1.1/32
awplus(config)# ip msdp peer 192.168.1.5 rp-filter in 100
```

To configure an outgoing RP filter for 192.168.1.5 using an access list named 'list1', use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp peer 192.168.1.5 rp-filter out list1
```

To remove an incoming RP filter for 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp peer 192.168.1.5 rp-filter in
```

To remove all RP filters for 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp peer 192.168.1.5 rp-filter
```

Related commands [ip msdp peer](#)
[ip msdp peer sg-filter](#)
[show ip msdp peer](#)

Command changes Version 5.5.1-0.1: command added

ip msdp peer sg-filter

Overview Use this command to configure filters for a peer to permit or deny SA messages based on the source and group addresses. The filters use an access list where the source must match the SA source address, and the destination must match the SA group address.

Use the **no** variant of this command to remove the filters.

Syntax `ip msdp peer <ip-address> sg-filter in {<100-199>|<2000-2699>|<access-list>}`
`ip msdp peer <ip-address> sg-filter out {<100-199>|<2000-2699>|<access-list>}`
`no ip msdp peer <ip-address> sg-filter [in|out]`

Parameter	Description
<ip-address>	The IPv4 address of the peer.
in	The incoming filter.
out	The outgoing filter.
<100-199>	IP extended access list.
<2000-2699>	IP extended access list (expanded range).
<access-list>	Access list name.

Default No SG filters are configured.

Mode Global Configuration

Example To configure an incoming SG filter for 192.168.1.5 using IP extended access list 100, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 100 permit ip 172.16.48.133/32
1.1.1.1/32
awplus(config)# ip msdp peer 192.168.1.5 sg-filter in 100
```

To configure an outgoing SG filter for 192.168.1.5 using an access list named 'list1', use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp peer 192.168.1.5 sg-filter out list1
```

To remove an incoming SG filter for 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp peer 192.168.1.5 sg-filter in
```

To remove all SG filters for 192.168.1.5, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp peer 192.168.1.5 sg-filter
```

Related commands [ip msdp peer](#)
[ip msdp peer rp-filter](#)
[show ip msdp peer](#)

Command changes Version 5.5.1-0.1: command added

ip msdp sa-cache-timeout

Overview Use this command to configure the MSDP Source-Active cache expiry timeout. The MSDP Source-Active cache timeout determines how long entries can exist in the cache before they expire.

Use the **no** variant of this command to reset the timeout to the default (75 seconds).

Syntax ip msdp sa-cache-timeout <75-300>
no ip msdp sa-cache-timeout

Parameter	Description
<75-300>	How long cache entries exist before they expire (in seconds).

Default 75 seconds

Mode Global Configuration

Example To configure the MSDP Source-Active cache timeout to 255 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip msdp sa-cache-timeout 255
```

To reset the MSDP Source-Active cache timeout to the default of 75 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# no ip msdp sa-cache-timeout
```

Related commands

- [ip msdp hold-time](#)
- [ip msdp keep-alive](#)
- [ip msdp mesh-group](#)
- [ip msdp mesh-group member](#)
- [ip msdp mesh-group member hold-time](#)
- [ip msdp mesh-group member keep-alive](#)
- [ip msdp peer](#)
- [ip msdp peer hold-time](#)
- [ip msdp peer keep-alive](#)

Command changes Version 5.5.1-0.1: command added

msdp default peer

Overview Use this command to configure an MSDP peer as a default peer. SA messages from the default peer will be accepted without Peer Reverse Path Forwarding (Peer-RPF) checks for the peer address against the advertised RP. It is possible to configure multiple default peers, however only one of the active peers that are configured as default will be recognized as the default.

Use the **no** variant of this command to remove an MSDP peer as a default peer.

Syntax `ip msdp peer <ip-address> default-peer`
`no ip msdp peer <ip-address> default-peer`

Parameter	Description
<code><ip-address></code>	The IPv4 address of the peer.

Default No default peer is configured.

Mode Global Configuration

Example To configure existing MSDP peer 192.168.1.5 as the default peer, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# ip msdp peer 192.168.1.5 default-peer
```

To remove MSDP peer 192.168.1.5 as the default peer, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no ip msdp peer 192.168.1.5 default-peer
```

Related commands [ip msdp peer](#)
[show ip msdp peer](#)

Command changes Version 5.5.1-0.1: command added

show debugging msdp

Overview Use this command to display which MSDP debugging options are currently enabled. Debugging is either on or off for each option.

Syntax show debugging msdp

Mode Privileged Exec

Example To display which MSDP debugging options are enabled, use the command:
`awplus# show debugging msdp`

Output The following shows typical output.

Example output from show debugging msdp

```
awplus# show debugging msdp
MSDP debugging status:
  MSDP state debugging is on
  MSDP incoming packet debugging is on
  MSDP outgoing packet debugging is off
  MSDP peer hold timer debugging is off
  MSDP peer connect timer debugging is off
  MSDP peer keep-alive timer debugging is off
  MSDP source-active state timer debugging is on
  MSDP source-active advertisement timer debugging is off
```

Parameters in the output from show debugging msdp

Parameter	Description
MSDP state	If enabled, shows when a peer has a change of state.
MSDP incoming packet	If enabled, shows when MSDP packets are received by the device.
MSDP outgoing packet	If enabled, shows when MSDP packets are transmitted by the device.
MSDP peer hold timer	If enabled, shows activity related to the peer hold timer, for example, when the timer starts, expires, or is reset.
MSDP peer connect timer	If enabled, shows activity related to the peer hold timer, for example, when the timer starts or expires.
MSDP peer keep-alive timer	If enabled, shows activity related to the peer keep-alive timer, for example, when the timer starts, expires, or is reset.
MSDP source-active state timer	If enabled, shows activity related to the source-active state timer, for example, when the timer starts, expires, or is reset.
MSDP source-active advertisement timer	If enabled, shows activity related to the source-active advertisement timer, for example, when the timer starts, expires, or is reset.

Related commands [debug msdp](#)
[debug msdp timer](#)

Command changes Version 5.5.1-0.1: command added

show ip msdp mesh-group

Overview Use this command to show information about the MSDP mesh-groups and the members within them.

Syntax show ip msdp mesh-group [detail]
show ip msdp mesh-group <group-name> [detail]
show ip msdp mesh-group <group-name> member <ip-address>
[detail]

Parameter	Description
detail	Show detailed information about the mesh groups.
<group-name>	The name of a mesh-group.
<ip-address>	The IPv4 address of a member of the mesh-group.

Mode Privileged Exec

Example To show brief information about every mesh-group and the members within, use the command:

```
awplus# show ip msdp mesh-group
```

To show information about mesh-group 'group2' and all of its members, use the command:

```
awplus# show ip msdp mesh-group group2
```

To show information about member 172.16.48.133 inside mesh-group 'group2', use the commands:

```
awplus# show ip msdp mesh-group group2 member 172.16.48.133
```

To show detailed information about member 172.16.48.133 inside mesh-group 'group2', use the commands:

```
awplus# show ip msdp mesh-group group2 member 172.16.48.133  
detail
```

Output The following shows typical output.

Example output from show ip msdp mesh-group

```
awplus# show ip msdp mesh-group
MSDP Mesh Group information:
-----
Mesh Group           : group1
-----
Local address        : 172.168.2.5
Members              : 0

-----
Mesh Group           : group2
-----
Local address        : 172.16.48.134
Members              : 2

Peer address         : 172.16.30.6
Local address        : 172.16.48.134
State                : Listening

Peer address         : 172.16.48.133
Local address        : 172.16.48.134
State                : Established
```

Example output from show ip msdp mesh-group group2

```
awplus# show ip msdp mesh-group group2
MSDP Mesh Group information:
-----
Mesh Group           : group2
-----
Local address        : 172.16.48.134
Members              : 2

Peer address         : 172.16.30.6
Local address        : 172.16.48.134
State                : Listening

Peer address         : 172.16.48.133
Local address        : 172.16.48.134
State                : Established
```

Example output from show ip msdp mesh-group group2 member 172.16.48.133

```
awplus# show ip msdp mesh-group group2 member 172.16.48.133
MSDP Mesh Group information:
-----
Mesh Group           : group2
-----
Local address        : 172.16.48.134
Members              : 2

Peer address         : 172.16.48.133
Local address        : 172.16.48.134
State                : Established
```

Example output from show ip msdp mesh-group group2 member 172.16.48.133 detail

```
awplus# show ip msdp mesh-group group2 member 172.16.48.133 detail
MSDP Mesh Group information:
-----
Mesh Group                      : group2
-----
Local address                    : 172.16.48.134
Members                          : 2

Peer address                     : 172.16.48.133
Local address                    : 172.16.48.134
State                           : Established
Configured default peer         : No
Mesh-group                      : group2
Counters:
  Keep Alive receive             : 19
  Keep Alive transmit            : 19
  Keep Alive receive error       : 0
  Source Active receive          : 20
  Source Active transmit         : 0
  Source Active receive error    : 0
  Unknown TLV receive           : 20

Timers (remaining seconds):
  Peer Hold                      : 21
  Keep Alive                     : 0
  Connect Retry                  : 0
SA Filters:
  SG filter out                  : None
  SG filter in                   : None
  RP filter out                  : None
  RP filter in                   : None
Counters:
  Out Permit                     : 0
  Out Deny                       : 0
  In Permit                      : 0
  In Deny                       : 0
```

Parameters in the output from show ip msdp mesh-group

Parameter	Description
Default peer	Yes, if the peer is a default peer, and No if not.
Mesh-group	If the peer is a member of a mesh-group then the name of the mesh-group will be displayed, otherwise "--".
Keep Alive receive	The number of keep alive messages the peer has received.
Keep Alive transmit	The number of keep alive messages the peer has transmitted.
Keep Alive receive error	The number of keep alive messages that have been received that contained errors.
Source active receive	The number of source active messages the peer has received.

Parameter	Description
Source active transmit	The number of source active messages the peer has transmitted.
Source active receive error	The number of source active messages that have been received that contained errors.
Unknown TLV receive	The number of messages received by the peer that were not keep alive or source active messages.
Peer Hold	The seconds remaining until the peer hold timer expires, at which point the peer connection ends.
Keep Alive	The seconds remaining until the keep alive timer expires, at which point the peer will send out a keep alive message.
Connect Retry	The seconds remaining till the connect retry timer expires, at which point another attempt is made to connect to the peer.
SG filter out	The name of the filter based on the source and group address of outgoing source active messages.
SG filter in	The name of the filter based on the source and group address of incoming source active messages.
RP filter out	The name of the filter based on the RP address of outgoing source active messages.
RP filter in	The name of the filter based on the RP address of incoming source active messages.
Out permit	The number of SA messages that have been permitted to send.
Out deny	The number of SA messages that have been denied from being sent.
In permit	The number of SA messages that have been permitted to be received.
In deny	The number of SA messages that have been denied to be received.

Related commands [ip msdp mesh-group](#)
[ip msdp mesh-group member](#)

Command changes Version 5.5.1-0.1: command added

show ip msdp peer

Overview Use this command to display MSDP peers, their addresses, and their current status. Use the **detail** parameter to display additional information on timers, filters, and counters.

Syntax show ip msdp peer [*<ip-address>*] [detail]

Parameter	Description
<i><ip-address></i>	The IPv4 address of the peer.
detail	Display additional information on timers, filters, and counters.

Mode Privileged Exec

Example To show the results for all MSDP peers, use the command:

```
awplus# show ip msdp peer
```

To show the results for MSDP peer 192.168.1.3, use the command:

```
awplus# show ip msdp peer 192.168.1.3
```

To show detailed results for MSDP peer 192.168.1.3, use the command:

```
awplus# show ip msdp peer 192.168.1.3 detail
```

Output The following shows typical output.

Example output from show ip msdp peer

```
awplus#show ip msdp peer

MSDP Peer Information:

Default peer           : None

Peer address           : 192.168.1.3
Local address          : 192.168.1.2
State                  : Established

Peer address           : 192.168.1.5
Local address          : 192.168.1.4
State                  : Connecting
```

Example output from show ip msdp peer 192.168.1.3

```
awplus#show ip msdp peer 192.168.1.3

MSDP Peer Information:

Peer address           : 192.168.1.3
Local address          : 192.168.1.2
State                  : Established
```

Example output from show ip msdp peer 192.168.1.3 detail

```
awplus#show ip msdp peer 192.168.1.3 detail

MSDP Peer Information:

Peer address           : 192.168.1.3
Local address          : 192.168.1.2
State                  : Established
Configured default peer : No
Mesh-group             : --
Counters:
  Keep Alive receive    : 32
  Keep Alive transmit   : 32
  Keep Alive receive error : 0
  Source Active receive : 32
  Source Active transmit : 0
  Source Active receive error : 0
  Unknown TLV receive   : 0
Timers (remaining seconds):
  Peer Hold             : 35
  Keep Alive            : 20
  Connect Retry         : 0
SA Filters:
  SG filter out         : -
  SG filter in          : -
  RP filter out         : -
  RP filter in          : -
Counters:
  Out Permit            : 0
  Out Deny              : 0
  In Permit             : 1472
  In Deny               : 0
```

Parameters in the output from show ip msdp peer

Parameter	Description
Default peer	Yes, if the peer is a default peer, and No if not.
Mesh-group	If the peer is a member of a mesh-group, then the name of the mesh-group will be displayed, otherwise "--".
Keep Alive receive	The number of keep alive messages the peer has received.
Keep Alive transmit	The number of keep alive messages the peer has transmitted.
Keep Alive receive error	The number of keep alive messages that have been received that contained errors.
Source active receive	The number of source active messages the peer has received.
Source active transmit	The number of source active messages the peer has transmitted.
Source active receive error	The number of source active messages that have been received that contained errors.
Unknown TLV receive	The number of messages received by the peer that were not keep alive or source active messages.
Peer Hold	The seconds remaining until the peer hold timer expires, at which point the peer connection ends.
Keep Alive	The seconds remaining until the keep alive timer expires, at which point the peer will send out a keep alive message.
Connect Retry	The seconds remaining till the connect retry timer expires, at which point another attempt is made to connect to the peer.
SG filter out	The name of the filter based on the source and group address of outgoing source active messages.
SG filter in	The name of the filter based on the source and group address of incoming source active messages.
RP filter out	The name of the filter based on the RP address of outgoing source active messages.
RP filter in	The name of the filter based on the RP address of incoming source active messages.

Parameter	Description
Out permit	The number of SA messages that have been permitted to send.
Out deny	The number of SA messages that have been denied from being sent.
In permit	The number of SA messages that have been permitted to be received.
In deny	The number of SA messages that have been denied to be received.

Related commands

- ip msdp mesh-group**
- ip msdp mesh-group member**
- ip msdp peer**
- ip msdp peer rp-filter**
- ip msdp peer sg-filter**
- msdp default peer**
- show ip msdp sa-cache**

Command changes Version 5.5.1-0.1: command added

show ip msdp sa-cache

Overview Use this command to display information about the MSDP Source Address Cache (SA-cache) entries.

Entries that are Local (Yes) are learned from the local multicast route table. They will expire when they are removed from the local multicast route table, and the MSDP expiry is always set to 0. Local entries will be advertised to MSDP peers.

Entries that are Local (No) have been received via an MSDP SA-message from an MSDP peer. They will expire when the expiry timer reaches 0, unless they are refreshed from the peer. SA-cache entries that are not local are advertised to PIM.

Syntax show ip msdp sa-cache

Mode Privileged Exec

Example To show information about the MSDP SA-cache entries, use the command:
awplus# show ip msdp sa-cache

Output The following shows typical output.

Example output from show ip msdp sa-cache

```
awplus# show ip msdp sa-cache

MSDP Source-Active cache:

Source-Active advertisement expiry (secs): 51

RP Address      Source Address  Group Address  Local  Expiry (secs)
-----
172.16.48.133   10.36.20.1      232.0.0.8      Yes    0
172.16.48.133   10.36.20.1      239.254.1.1     Yes    0
172.16.48.133   10.36.20.1      239.254.1.2     Yes    0
172.16.48.133   10.36.20.1      239.254.1.3     Yes    0
172.16.48.133   10.36.20.1      239.254.1.4     Yes    0
172.16.48.133   10.36.20.1      239.254.1.7     Yes    0
172.16.48.133   10.36.20.1      239.254.1.8     Yes    0
172.16.48.133   10.36.20.1      239.254.1.9     Yes    0
```

Parameters in the output from show ip msdp sa-cache

Parameter	Description
Source-Active advertisement expiry (secs)	The number of seconds until the RP will advertise its sources by sending out SA messages.
RP Address	The RP address of the cache entry.
Source Address	The source address of the cache entry.
Group Address	The group address of the cache entry.
Local	Whether the entry is local, Yes or No.
Expiry (secs)	The number of seconds until the entry expires.

Related commands [clear ip msdp sa-cache](#)
[ip msdp peer](#)
[show ip msdp peer](#)

Command changes Version 5.5.1-0.1: command added

Part 5: Access and Security

37

IPv4 Hardware Access Control List (ACL) Commands

- Contents**
- **Introduction** on page 1797
 - **access-group** on page 1800
 - **access-list (numbered hardware ACL for ICMP)** on page 1803
 - **access-list (numbered hardware ACL for IP packets)** on page 1808
 - **access-list (numbered hardware ACL for IP protocols)** on page 1812
 - **access-list (numbered hardware ACL for MAC addresses)** on page 1818
 - **access-list (numbered hardware ACL for TCP or UDP)** on page 1822
 - **access-list hardware (named hardware ACL)** on page 1827
 - **access-list hardware-deny-log** on page 1829
 - **acl-group ip address** on page 1833
 - **acl-group ip port** on page 1834
 - **(acl-group ip port range)** on page 1835
 - **clear access-list counters** on page 1837
 - **commit (IPv4)** on page 1838
 - **ip (ip-host-group)** on page 1839
 - **(named hardware ACL entry for ICMP)** on page 1841
 - **(named hardware ACL entry for IP packets)** on page 1847
 - **(named hardware ACL entry for IP protocols)** on page 1853
 - **(named hardware ACL entry for MAC addresses)** on page 1860
 - **(named hardware ACL entry for TCP or UDP)** on page 1864
 - **platform acls-to-vlanclassifiers** on page 1869
 - **show access-group** on page 1871
 - **show access-list (IPv4 Hardware ACLs)** on page 1872
 - **show access-list counters** on page 1874
 - **show acl-group ip address** on page 1876
 - **show acl-group ip port** on page 1877
 - **show interface access-group** on page 1878

Introduction

Overview This chapter provides an alphabetical reference of IPv4 Hardware Access Control List (ACL) commands. It contains detailed command information and command examples about IPv4 hardware ACLs, which you can apply directly to interfaces using the **access-group** command.

To apply ACLs to an LACP channel group, apply it to all the individual switch ports in the channel group. To apply ACLs to a static channel group, apply it to the static channel group itself.

Most ACL command titles include information in parentheses:

- When the command title ends with words in parentheses, these words indicate usage instead of keywords to enter into the CLI. For example, the title **access-list (numbered hardware ACL for ICMP)** indicates that the command is used to create an ACL with the syntax:

```
access-list <3000-3699> <action> icmp <source-ip> <dest-ip>  
[icmp-type <number>] [vlan <1-4094>]
```

- When the command title is completely surrounded by parentheses, the title indicates the type of ACL filter instead of keywords to enter into the CLI. For example, the title **(named hardware ACL: ICMP entry)** represents a command with the syntax:

```
[<sequence-number>] <action> icmp <source-ip> <dest-ip> [icmp-  
type <number>] [vlan <1-4094>]
```

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.

Sub-modes Many of the ACL commands operate from sub-modes that are specific to particular ACL types. The following table shows the CLI prompts at which ACL commands are entered.

IPv4 Hardware Access List Commands and Prompts

Command Name	Command Mode	Prompt
show interface access-group	Privileged Exec	awplus#
show access-group	Privileged Exec	awplus#
show access-list (IPv4 Hardware ACLs)	Privileged Exec	awplus#
show acl-group ip address	Privileged Exec	awplus#
show acl-group ip port	Privileged Exec	awplus#
show interface access-group	Privileged Exec	awplus#
access-list (numbered hardware ACL for IP packets)	Global Configuration	awplus(config)#
access-list (numbered hardware ACL for ICMP)	Global Configuration	awplus(config)#
access-list (numbered hardware ACL for IP protocols)	Global Configuration	awplus(config)#
access-list (numbered hardware ACL for TCP or UDP)	Global Configuration	awplus(config)#
access-list (numbered hardware ACL for MAC addresses)	Global Configuration	awplus(config)#
access-list hardware (named hardware ACL)	Global Configuration	awplus(config)#
access-list hardware-deny-log	Global Configuration	awplus(config)#
acl-group ip address	Global Configuration	awplus(config)#
acl-group ip port	Global Configuration	awplus(config)#
(named hardware ACL entry for IP packets)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#
(named hardware ACL entry for ICMP)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#

Command Name	Command Mode	Prompt
(named hardware ACL entry for IP protocols)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#
(named hardware ACL entry for TCP or UDP)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#
(named hardware ACL entry for MAC addresses)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#
commit (IPv4)	IPv4 Hardware ACL Configuration	awplus(config-ip-hw-acl)#
ip (ip-host-group)	ACL Host Group Configuration	awplus(config-ip-host-group)#
(acl-group ip port range)	ACL Port Group Configuration	awplus(config-ip-port-group)#
access-group	Global Configuration	awplus(config)#
access-group	Interface Configuration	awplus(config-if)#

References For descriptions of ACLs, and further information about rules when applying them, see the [ACL Feature Overview and Configuration Guide](#).

For more information on link aggregation see the following references:

- the [Link Aggregation Feature Overview_and_Configuration_Guide](#).
- [Link Aggregation Commands](#)

access-group

Overview This command adds or removes a hardware-based access-list to or from a switch port interface or interfaces. The number of hardware numbered and named access-lists that can be added to a switch port interface is determined by the available memory in hardware-based packet classification tables.

This command works in both Global Configuration and Interface Configuration modes to apply hardware access-lists to all switch port interfaces or selected switch port interfaces respectively.

The **no** variant of this command removes the selected access-list from an interface.

Syntax `access-group [<3000-3699>|<4000-4699>|<hardware-access-list-name>]`
`no access-group [<3000-3699>|<4000-4699>|<hardware-access-list-name>]`

Parameter	Description
<code><3000-3699></code>	Hardware IP access-list.
<code><4000-4699></code>	Hardware MAC access-list.
<code><hardware-access-list-name></code>	The hardware access-list name.

Mode Interface Configuration or Global Configuration

Default Any traffic on an interface controlled by a hardware ACL that does not explicitly match a filter is permitted.

Usage notes First create an IP access-list that applies the appropriate permit/deny requirements with the [access-list \(numbered hardware ACL for IP packets\)](#), the [access-list \(numbered hardware ACL for MAC addresses\)](#) or the [access-list hardware \(named hardware ACL\)](#). Then use this command to apply this hardware access- list to a specific port or port range. Note that this command will apply the access-list only to incoming data packets.

To apply ACLs to an LACP aggregated link, apply it to all the individual switch ports in the aggregated group. To apply ACLs to a static channel group, apply it to the static channel group itself. An ACL can even be applied to a static aggregated link that spans more than one switch instance ([Link Aggregation Commands](#)).

Note that you cannot apply software numbered ACLs to switch port interfaces with the access-group command. This command will only apply hardware ACLs.

NOTE: Hardware ACLs will access unless by an ACL action.

Examples To add the numbered hardware access-list 3005 to all switch ports, enter the following commands:

```
awplus# configure terminal
awplus(config)# access-group 3005
```

To add the numbered hardware access-list 3005 to switch port interface port1.0.1, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# access-group 3005
```

To add the named hardware access-list "hw-acl" to switch port interface port1.0.2, enter the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# access-group hw-acl
```

To apply an ACL to static channel group 2 containing switch port1.0.3 and port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3-port1.0.4
awplus(config-if)# static-channel-group 2
awplus(config)# interface sa2
awplus(config-if)# access-group 3000
```

Related commands

- access-list hardware (named hardware ACL)**
- access-list (numbered hardware ACL for IP packets)**
- access-list (numbered hardware ACL for MAC addresses)**
- show access-group**
- show interface access-group**

access-list (numbered hardware ACL for ICMP)

Overview This command creates an access-list for use with hardware classification. The access-list will match on ICMP packets that have the specified source and destination IP addresses and, optionally, ICMP type. You can use the value **any** instead of source or destination address if an address does not matter.

Once you have configured the ACL, you can use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

The optional **vlan** parameter can be used to match tagged (802.1q) packets.

The **no** variant of this command removes the previously specified access-list.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a "send" action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax `access-list <3000-3699> <action> icmp <source-ip> <dest-ip>`
`[icmp-type <number>] [vlan <1-4094>] [log]`
`no access-list <3000-3699>`

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<3000-3699>	An ID number for this hardware IP access-list.
<action>	The action that the switch will take on matching packets. See the table above for valid values.
icmp	Match against ICMP packets
<source-ip>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <ip-addr> Match a single source host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
	<ip-addr> <reverse-mask> Match any source IP address within the specified subnet. Specify the subnet by entering a

Parameter	Description
	reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
icmp-type <i><number></i>	The type of ICMP message to match against, as defined in RFC792 and RFC950. Values include:
0	Echo replies.
3	Destination unreachable messages.
4	Source quench messages.
5	Redirect (change route) messages.
8	Echo requests.
11	Time exceeded messages.
12	Parameter problem messages.
13	Timestamp requests.
14	Timestamp replies.

Parameter	Description
	15 Information requests.
	16 Information replies.
	17 Address mask requests.
	18 Address mask replies.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode Global Configuration

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes This command creates an ACL for use with hardware classification. Once you have configured the ACL, use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

ACLs numbered in the range 3000-3699 match on packets that have the specified source and destination IP addresses.

ICMP ACLs will match any ICMP packet that has the specified source and destination IP addresses and ICMP type. The ICMP type is an optional parameter.

Examples To create an access-list that will permit ICMP packets with a source address of 192.168.1.0/24 with any destination address and an ICMP type of 5 enter the following commands:

```
awplus# configure terminal
awplus(config)# access-list 3000 permit icmp 192.168.1.0/24 any
icmp-type 5
```

To destroy the access-list with an access-list identity of 3000 enter the following commands:

```
awplus# configure terminal
awplus(config)# no access-list 3000
```

Related commands **access-group**
access-list hardware-deny-log
match access-group
show running-config
show access-list (IPv4 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

access-list (numbered hardware ACL for IP packets)

Overview This command creates an access-list for use with hardware classification. The access-list will match on packets that have the specified source and destination IP addresses. You can use the value **any** instead of source or destination address if an address does not matter.

Once you have configured the ACL, you can use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

The optional **vlan** parameter can be used to match tagged (802.1q) packets.

The **no** variant of this command removes the previously specified IP hardware access-list.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax `access-list <3000-3699> <action> ip <source-ip> <dest-ip> [vlan <1-4094>] [log]`
`no access-list <3000-3699>`

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

IP and ICMP parameters in access-list (hardware IP numbered)

Parameter	Description
<3000-3699>	An ID number for this hardware IP access-list.
<action>	The action that the switch will take on matching packets. See the table above for valid values.
ip	Match against IP packets
<source-ip>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <ip-addr> Match a single source host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.

Parameter	Description
<i><ip-addr></i> <i><reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
vlan <i><1-4094></i>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode Global Configuration

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes This command creates an ACL for use with hardware classification. Once you have configured the ACL, use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

ACLs numbered in the range 3000–3699 match on packets that have the specified source and destination IP addresses.

Examples To create an access-list that will permit IP packets with a source address of 192.168.1.1 and any destination address, enter the commands:

```
awplus# configure terminal
```

```
awplus(config)# access-list 3000 permit ip 192.168.1.1/32 any
```

To destroy the access-list with an access-list identity of 3000 enter the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no access-list 3000
```

Related commands

- access-group**
- access-list hardware-deny-log**
- match access-group**
- show running-config**
- show access-list (IPv4 Hardware ACLs)**

Command changes

Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

access-list (numbered hardware ACL for IP protocols)

Overview This command creates an access-list for use with hardware classification. The access-list will match on packets that have the specified source and destination IP addresses and IP protocol number. You can use the value **any** instead of source or destination address if an address does not matter.

Once you have configured the ACL, you can use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

The optional **vlan** parameter can be used to match tagged (802.1q) packets.

The **no** variant of this command removes the previously specified IP hardware access-list.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a "send" action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax `access-list <3000-3699> <action> proto <1-255> <source-ip>
<dest-ip> [vlan <1-4094>] [log]`
`no access-list <3000-3699>`

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameters in access-list (hardware IP numbered)

Parameter	Description
<3000-3699>	An ID number for this hardware IP access-list.
<action>	The action that the switch will take on matching packets. See the table above for valid values.
proto <1-255>	The IP protocol number to match against, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.
<source-ip>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <ip-addr> Match a single source host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> Match any source IP address within the specified subnet.

Parameter	Description
	Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
vlan <i><1-4094></i>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]

Protocol Number	Protocol Description [RFC]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)
89	OSPFv2 [RFC1583]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393

Protocol Number	Protocol Description [RFC]
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode Global Configuration

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes This command creates an ACL for use with hardware classification. Once you have configured the ACL, use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

ACLs numbered in the range 3000-3699 match on packets that have the specified source and destination IP addresses.

Examples To create an access-list that will deny all IGMP packets (IP protocol 2) from the 192.168.0.0 network, enter the commands:

```
awplus# configure terminal
```

```
awplus(config)# access-list 3000 deny proto 2 192.168.0.0/16 any
```

To destroy the access-list with an access-list identity of 3000 enter the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no access-list 3000
```

Related commands **access-group**
access-list hardware-deny-log
match access-group
show running-config
show access-list (IPv4 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

access-list (numbered hardware ACL for MAC addresses)

Overview This command creates an access-list for use with hardware classification. The access-list will match on packets that have the specified source and destination MAC addresses. You can use the value **any** instead of source or destination address if an address does not matter.

Once you have configured the ACL, you can use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

The **no** variant of this command removes the specified MAC hardware filter access-list.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a "send" action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax `access-list <4000-4699> <action> {<source-mac>|any} {<dest-mac>|any} [vlan <1-4094>] [inner-vlan <1-4094>]`
`no access-list <4000-4699>`

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<4000-4699>	An ID number for this hardware IP access-list.
<action>	The action that the switch will take on matching packets. See the table above for valid values.
<source-mac>	The source MAC address to match against, followed by the mask. Enter the address in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
any	Match against any source MAC address.
<dest-mac>	The destination MAC address to match against, followed by the mask. Enter the address in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.

Parameter	Description
any	Match against any destination MAC address.
vlan <1-4094>	Match against the specified ID in the packet's VLAN tag.
inner-vlan <1-4094>	Match against the inner VLAN tag (VID). This parameter is used within double-tagged VLANs. It is sometimes referred to as the C-TAG (Customer VLAN TAG), where the vlan VID tag is referred to as the S-TAG (Service VLAN TAG).

Mode Global Configuration

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes This command creates an ACL for use with hardware classification. Once you have configured the ACL, use the [access-group](#) or the [match access-group](#) command to apply this ACL to a port, VLAN or QoS class-map.

ACLs numbered in the range 4000-4699 match on packets that have the specified source and destination MAC addresses.

Examples To create an access-list that will permit packets with a source MAC address of 0000.00ab.1234 and any destination address, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 4000 permit 0000.00ab.1234
0000.0000.0000 any
```

To create an access-list that will permit packets if their source MAC address starts with 0000.00ab, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 4001 permit 0000.00ab.1234
0000.0000.FFFF any
```

To create an access-list that will send a copy of packets to the mirror port if their source MAC address starts with 0000.00ab, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 4001 copy-to-mirror 0000.00ab.1234
0000.0000.FFFF any
```

You also need to configure the mirror port with the [mirror interface](#) command.

To destroy the access-list with an access-list identity of 4000 enter the commands:

```
awplus# configure terminal
awplus(config)# no access-list 4000
```


Related commands **access-group**
match access-group
show running-config
show access-list (IPv4 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

access-list (numbered hardware ACL for TCP or UDP)

Overview This command creates an access-list for use with hardware classification. The access-list will match on TCP or UDP packets that have the specified source and destination IP addresses and optionally, port values. You can use the value **any** instead of source or destination IP address if an address does not matter.

Once you have configured the ACL, you can use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

You can use the optional **vlan** parameter to match tagged (802.1q) packets.

The **no** variant of this command removes the specified IP hardware access-list.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a "send" action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax `access-list <3000-3699> <action> {tcp|udp} <source-ip> [<source-ports>] <dest-ip> [<dest-ports>] [vlan <1-4094>] [log]`
`no access-list <3000-3699>`

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<3000-3699>	An ID number for this hardware IP access-list.
<action>	The action that the switch will take on matching packets. See the table above for valid values.
tcp	Match against TCP packets.
udp	Match against UDP packets.
<source-ip>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <ip-addr> Match a single source host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.

Parameter	Description
<i><ip-addr> <reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><source-ports></i>	Match source TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <0-65535>	Match a single port number.
lt <0-65535>	Match all port numbers that are less than the specified port number.
gt <0-65535>	Match all port numbers that are greater than the specified port number.
ne <0-65535>	Match all port numbers except the specified port number.
range <start-port> <end-port>	Match a range of port numbers.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <ip-addr>	Match a single destination host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr>/<prefix>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<ip-addr> <reverse-mask>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1

Parameter	Description
	0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ports></i>	Match destination TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <0-65535>	Match a single port number.
lt <0-65535>	Match all port numbers that are less than the specified port number.
gt <0-65535>	Match all port numbers that are greater than the specified port number.
ne <0-65535>	Match all port numbers except the specified port number.
range <start-port> <end-port>	Match a range of port numbers.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode Global Configuration

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes This command creates an ACL for use with hardware classification. Once you have configured the ACL, use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map.

ACLs numbered in the range 3000-3699 match on packets that have the specified source and destination IP addresses.

Examples To create an access-list that will permit TCP packets with a destination address of 192.168.1.1, a destination port of 80, and any source address and source port, enter the commands:

```
awplus# configure terminal
awplus(config)# access-list 3000 permit tcp any 192.168.1.1/32
eq 80
```

To create an access-list that will copy TCP packets to the mirror port, if they have a destination address of 192.168.1.1, a destination port of 80, and any source address and source port, enter the commands:

```
awplus# configure terminal
awplus(config)# access-list 3000 copy-to-mirror tcp any
192.168.1.1/32 eq 80
```

You also need to configure the mirror port with the [mirror interface](#) command.

Related commands [access-group](#)
[access-list hardware-deny-log](#)
[match access-group](#)
[show running-config](#)
[show access-list \(IPv4 Hardware ACLs\)](#)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

access-list hardware (named hardware ACL)

Overview This command creates a named hardware access-list and puts you into IPv4 Hardware ACL Configuration mode, where you can add filter entries to the ACL.

Once you have configured the ACL, you can use the [access-group](#) or the [match access-group](#) command to apply this ACL to a port, VLAN or QoS class-map.

The **no** variant of this command removes the specified named hardware ACL.

Syntax access-list hardware <name>
no access-list hardware <name>

Parameter	Description
<name>	Specify a name for the hardware ACL.

Mode Global Configuration

Default Any traffic on an interface controlled by a hardware ACL that does not explicitly match a filter is permitted.

Usage notes Use this command to name a hardware ACL and enter the IPv4 Hardware ACL Configuration mode. If the named hardware ACL does not exist, it will be created after entry. If the named hardware ACL already exists, then this command puts you into IPv4 Hardware ACL Configuration mode for that existing ACL.

Entering this command moves you to the IPv4 Hardware ACL Configuration mode (config-ip-hw-acl prompt), so you can enter ACL filters with sequence numbers. From this prompt, configure the filters for the ACL. See the [ACL Feature Overview and Configuration Guide](#) for complete examples of configured sequenced numbered ACLs.

NOTE: Hardware ACLs will access unless by an ACL action.

Examples To create the hardware access-list named "ACL-1" and enter the IPv4 Hardware ACL Configuration mode to specify the ACL filter entry, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware ACL-1
awplus(config-ip-hw-acl)#
```

To remove the hardware access-list named "ACL-1", use the commands:

```
awplus# configure terminal
awplus(config)# no access-list hardware ACL-1
```

Related commands

- access-group**
 - (named hardware ACL entry for ICMP)
 - (named hardware ACL entry for IP protocols)
 - (named hardware ACL entry for TCP or UDP)
 - (access-list standard named filter)
- show access-group**
- show interface access-group**
- show access-list (IPv4 Hardware ACLs)**

access-list hardware-deny-log

Overview Use this command to enable logging of packets that are denied by hardware IP ACLs. Hardware IP ACLs are ACLs with an ID number from 3000 to 3699. If you turn on logging, the switch will produce a log message when it drops denied packets.



CAUTION: *If you enable this logging, do not use an action of or in any of the switch's ACLs. If you do, packets that match those ACLs will also be dropped.*

Use the **no** variant of this command to disable logging of packets that are denied by hardware IP ACLs.

Syntax `access-list hardware-deny-log [info|warn] [rate <1-1000>] [burst <1-1000>] [timeout <1-3600>]`
`no access-list hardware-deny-log`

Parameter	Description
info	Give the log messages a severity level of 'info'. This is the default severity level.
warn	Give the log messages a severity level of 'warn'. If you want the messages to go to the buffered, permanent, and external log as well as the terminal, specify this parameter.
rate <1-1000>	This limits the number of log messages produced per hour. The switch will stop creating log messages if packets are denied at a higher rate than this specified rate. The default is 12 packets per hour. This means, for example, that if there are 60 denied packets in the first hour, then at most the first 12 of these packets will be logged. After that, logging will stop unless the rate drops below 12 an hour. (The actual number of packets logged depends on the number of flows the dropped packets come from; see the burst parameter).
burst <1-1000>	This is the maximum initial number of packets to log for a given flow. A flow is a set of packets with the same source IP address, destination IP address, source port, and destination port. The default is 5. The burst number reduces by 1 each time a packet in the flow is logged. Then it increases by 1 again every time the rate drops below the limit set by the rate parameter, up to the burst number.
timeout <1-3600>	This is the length of time it takes for a flow record to expire, in seconds. The switch considers that a flow has expired if it hasn't received any packets that match that flow for the timeout number of seconds. The default is 3600 seconds (1 hour). When a flow expires, its burst value is reset and logging may restart (depending on the current rate of denied packets).

Default Disabled

Mode Global Configuration

Usage notes To enable logging for a particular ACL, enter:

- this command (**access-list hardware-deny-log**)
- the command **terminal monitor**, and
- a **log** parameter at the end of the desired ACL.

The switch will send the log messages to:

- The terminal monitor, by default, as long as you enter the command **terminal monitor**, and
- If you change the severity of the messages to **warn**, to the buffered log, permanent log, and external log as well. The external log defines what logs will be sent to external syslog servers.

The log message format is:

```
DENY> IN=<interface-name> OUT=<blank> MAC=<dest-mac-addr:src-  
mac-addr:eth-type> SRC=<source-ip-address> DST=<dest-ip-address>  
LEN=<packet-length> TOS=<type-of-service> PREC=<precedence>  
TTL=<time-to-live> ID=<packet-ID> PROTO=<L4-protocol>  
SPT=<L4-source-port> DPT=<L4-dest-port> LEN=<L4-packet-length>  
MARK=<internal-packet-marking>
```

An example of a permanent log message is:

```
2023 March 03 07:04:37 local5.warning awplus ulogd[931]: DENY>  
IN=vlan100 OUT= MAC=e0:1a:ea:50:51:fc:00:00:11:11:22:22:08:00  
SRC=192.168.1.100 DST=192.170.1.1 LEN=42 TOS=00 PREC=0x00 TTL=64  
ID=0 PROTO=UDP SPT=63 DPT=63 LEN=22 MARK=0x20000000
```

Example To log packets denied by ACL 3000, which denies all Echo requests, use the commands:

```
awplus# terminal monitor  
awplus# configure terminal  
awplus(config)# access-list hardware-deny-log  
awplus(config)# access-list 3000 deny icmp any any icmp-type 8
```

Related commands (named IPv6 hardware ACL: ICMP entry)
(named IPv6 hardware ACL: IPv6 packet entry)
(named IPv6 hardware ACL: IP protocol entry)
(named IPv6 hardware ACL: TCP or UDP entry)
(named hardware ACL entry for ICMP)
(named hardware ACL entry for IP packets)
(named hardware ACL entry for IP protocols)
(named hardware ACL entry for TCP or UDP)
access-list (numbered hardware ACL for ICMP)
access-list (numbered hardware ACL for IP packets)
access-list (numbered hardware ACL for IP protocols)
access-list (numbered hardware ACL for TCP or UDP)
terminal monitor

Command changes Version 5.5.3-0.1: command added

acl-group ip address

Overview Use this command to create a new named IPv4 ACL group that contains one or more IPv4 host or subnets.

This command creates a named IPv4 ACL group and enters the ACL Host Group config mode. IPv4 hosts or subnets can be added to or removed from this group. This host group can be used as a source or destination match for any hardware ACL to simplify large ACL configs with lots of IPv4 hosts.

Use the **no** variant of this command to delete an IPv4 ACL group.

Syntax `acl-group ip address <group>`
`no acl-group ip address <group>`

Parameter	Description
<code><group></code>	The name of the IPv4 ACL group.

Default No ACL groups exist by default.

Mode Global Configuration

Example To create an IPv4 ACL group named IPV4 _GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip address IPV4_GROUP1
awplus(config-ip-host-group)#
```

To delete an IPv4 ACL group named IPV4 _GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# no acl-group ip address IPV4_GROUP1
```

Related commands [ip \(ip-host-group\)](#)
[show acl-group ip address](#)

Command changes Version 5.5.0-1.1: command added

acl-group ip port

Overview Use this command to create a new named port ACL group that contains one or more port rules for an ACL.

This command creates a named port ACL group and enters the ACL Port Group config mode. Port matching rules can be added to or removed from this group. This host group can be used to match on source or destination ports when used with an ACL.

Use the **no** variant of this command to delete a port ACL group.

Syntax `acl-group ip port <group>`
`no acl-group ip port <group>`

Parameter	Description
<code><group></code>	The name of the port ACL group.

Default No ACL groups exist by default.

Mode Global Configuration

Example To create a port ACL group named PORT_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip port PORT_GROUP1
awplus(config-ip-port-group)#
```

To delete a port ACL group named PORT_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# no acl-group ip port PORT_GROUP1
```

Related commands [\(acl-group ip port range\)](#)
[show acl-group ip port](#)

Command changes Version 5.5.0-1.1: command added

(acl-group ip port range)

Overview Use this command to add one or more protocol port rules on a port ACL group. These port matching rules are used to simplify large ACL configs where many ACLs block or permit on the same service ports.

Use the **no** variant of this command to remove a rule match on protocol ports.

Syntax eq <0-65535>
lt <0-65535>
gt <0-65535>
ne <0-65535>
range <0-65535> <0-65535>
no eq <0-65535>
no lt <0-65535>
no gt <0-65535>
no ne <0-65535>
no range <0-65535> <0-65535>

Parameter	Description
eq	The protocol port matches if equal to this number.
lt	The protocol port matches if less than this number.
gt	The protocol port matches if greater than this number.
ne	The protocol port matches if not equal to this number.
range	The protocol port matches if it is in this range.
<0-65535>	The port number.

Default The port ACL group will match on all ports by default.

Mode IP ACL Port Group Configuration

Example To add the rule match on protocol ports equal to 20 on a port ACL group, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip port PORT_GROUP1
awplus(config-ip-port-group)# eq 20
```

To add the rule match on protocol ports between 20 and 50 on a port ACL group, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip port PORT_GROUP1
awplus(config-ip-port-group)# range 20 50
```

To add the rule match on protocol ports greater than 20 except 30 on a port ACL group, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip port PORT_GROUP1
awplus(config-ip-port-group)# gt 20
awplus(config-ip-port-group)# ne 30
```

To remove the rule match on protocol ports between 20 and 50 on a port ACL group, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip port PORT_GROUP1
awplus(config-ip-port-group)# no range 20 50
```

Related commands [acl-group ip port](#)
[show acl-group ip port](#)

Command changes Version 5.5.0-1.1: command added

clear access-list counters

Overview Use this command to reset the hardware access-list counters to zero. The access-list counters show the number of packets that match your hardware ACLs. Every time a hardware ACL allows or drops a packet, its counter increments.

Syntax clear access-list counters [*<acl>*]

Parameter	Description
<i><acl></i>	Clear the counters for only the specified ACL. You can enter the ACL name or number.

Mode Privileged Exec

Usage notes To view the counter values, use the command [show access-list counters](#).

Example To clear the counters for the ACL named ACL-1, use the command:
awplus# clear access-list counters ACL-1

Related commands [show access-list counters](#)

Command changes Version 5.5.2-2.1: command added

commit (IPv4)

Overview Use this command to commit the IPv4 ACL filter configuration entered at the console to the hardware immediately without exiting the IPv4 Hardware ACL Configuration mode.

This command forces the associated hardware and software IPv4 ACLs to synchronize.

Syntax `commit`

Mode IPv4 Hardware ACL Configuration

Usage notes Normally, when an IPv4 hardware ACL is edited, the new configuration state of the IPv4 ACL is not written to hardware until you exit IPv4 Hardware ACL Configuration mode. By entering this command you can ensure that the current state of a hardware access-list that is being edited is written to hardware immediately.

Scripts typically do not include the **exit** command to exit configuration modes, potentially leading to IPv4 ACL filters in hardware not being correctly updated. Using this **commit** command in a configuration script after specifying an IPv4 hardware ACL filter ensures that it is updated in the hardware immediately.

Example To update the hardware with the IPv4 ACL filter configuration, use the command:

```
awplus# configure terminal
awplus(config)# access-list hardware my-hw-list
awplus(config-ip-hw-acl)# commit
```

Related commands [access-list hardware \(named hardware ACL\)](#)

ip (ip-host-group)

Overview Use this command to add an IPv4 host or subnet to an IPv4 ACL group. Adding IPv4 hosts and subnets to an ACL group allows you to simplify ACL config when the same IP addresses are required for many ACLs.

Use the **no** variant of this command to remove an IPv4 host or subnet from an IPv4 ACL group.

Syntax ip {any|<match-ip>}
no ip {any|<match-ip>}

Parameter	Description
any	Match any IP address.
<match-ip>	The addresses to match against. You can specify a single host or a subnet. The following are the valid formats for specifying the addresses:
	<ip-addr> Match a single host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> Match any IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
	<ip-addr> <reverse-mask> Match any IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.

Default No hosts or subnets are in an IPv4 ACL group by default.

Mode IP ACL Host Group Configuration

Example To add the subnet 192.168.1.0/24 to an IPv4 ACL group IPV4_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip address IPV4_GROUP1
awplus(config-ip-host-group)# ip 192.168.1.0/24
```

To remove the subnet 192.168.1.0/24 from an IPv4 ACL group IPV4_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ip address IPV4_GROUP1
awplus(config-ip-host-group)# no ip 192.168.1.0/24
```

Related commands [acl-group ip address](#)
[show acl-group ip address](#)

Command changes Version 5.5.0-1.1: command added

(named hardware ACL entry for ICMP)

Overview Use this command to add a new ICMP filter entry to the current hardware access-list. The filter will match on any ICMP packet that has the specified source and destination IP addresses and (optionally) ICMP type. You can specify the value **any** if source or destination address does not matter.

If you specify a sequence number, the switch inserts the new filter at the specified location. Otherwise, the switch adds the new filter to the end of the access-list.

The **no** variant of this command removes an ICMP filter entry from the current hardware access-list. You can specify the ICMP filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its ICMP filter profile without specifying its sequence number (e.g. **no permit icmp 192.168.1.0/24 any icmp-type 11**).

You can find the sequence number by running the **show access-list (IPv4 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* icmp *<source-ip>* *<dest-ip>* [icmp-type *<number>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* icmp *<source-ip>* *<dest-ip>* [icmp-type *<number>*]
[vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
icmp	Match against ICMP packets
<i><source-ip></i>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <i><ip-addr></i> Match a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.

Parameter	Description
	<i><ip-addr>/<prefix></i> Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
	<i><ip-addr></i> <i><reverse-mask></i> Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
	any Match any destination IP address.
	host <i><ip-addr></i> Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
	<i><ip-addr>/<prefix></i> Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
	<i><ip-addr></i> <i><reverse-mask></i> Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
icmp-type <i><number></i>	The type of ICMP message to match against, as defined in RFC792 and RFC950. Values include:
	0 Echo replies.
	3 Destination unreachable messages.

Parameter	Description
	4 Source quench messages.
	5 Redirect (change route) messages.
	8 Echo requests.
	11 Time exceeded messages.
	12 Parameter problem messages.
	13 Timestamp requests.
	14 Timestamp replies.
	15 Information requests.
	16 Information replies.
	17 Address mask requests.
	18 Address mask replies.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv4 Hardware ACL Configuration (accessed by running the command **access-list hardware (named hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **access-list hardware (named hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ip-hw-acl)#
```

Then use this command (and the other “named hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL. You can insert a new filter entry into the middle of an existing list by specifying the appropriate sequence number. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Then use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add an access-list filter entry with a sequence number of 100 to the access-list named “my-list” that will permit ICMP packets with a source address of 192.168.1.0/24, any destination address and an ICMP type of 5, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# 100 permit icmp 192.168.1.0/24 any
icmp-type 5
```

To remove an access-list filter entry with a sequence number of 100 from the access-list named “my-list”, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# no 100
```

Related commands

- access-group**
- access-list hardware (named hardware ACL)**
- access-list hardware-deny-log**
- match access-group**
- show running-config**
- show access-list (IPv4 Hardware ACLs)**

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named hardware ACL entry for IP packets)

Overview Use this command to add an IP packet filter entry to the current hardware access-list. The filter will match on IP packets that have the specified IP and/or MAC addresses. You can use the value **any** instead of source or destination IP or MAC address if an address does not matter.

If you specify a sequence number, the switch inserts the new filter at the specified location. Otherwise, the switch adds the new filter to the end of the access-list.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny ip 192.168.0.0/16 any**).

You can find the sequence number by running the **show access-list (IPv4 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* ip *<source-ip>* *<dest-ip>* [*<source-mac>* *<dest-mac>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* ip *<source-ip>* *<dest-ip>* [*<source-mac>* *<dest-mac>*]
[vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
ip	Match against IP packets
<i><source-ip></i>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	dhcpsnooping Match the source address learned from the DHCP Snooping binding database.
	host <i><ip-addr></i> Match a single source host with the IP address given by

Parameter	Description
	<i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr></i> <i><reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><source-mac></i>	The source MAC address to match against. You can specify a single MAC address, a range (through a mask), the address learned from DHCP snooping, or any:
any	Match against any source MAC address.

Parameter	Description
<i><source-mac></i>	The source MAC address to match against, followed by the mask. Enter the address in the format <i><HHHH.HHHH.HHHH></i>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <i><HHHH.HHHH.HHHH></i>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
dhcpsnooping	Match the source address learned from the DHCP Snooping binding database.
<i><dest-mac></i>	The destination MAC address to match against. You can specify a single MAC address, a range (through a mask), or any:
any	Match against any destination MAC address.
<i><dest-mac></i>	The destination MAC address to match against, followed by the mask. Enter the address in the format <i><HHHH.HHHH.HHHH></i>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <i><HHHH.HHHH.HHHH></i>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
vlan <i><1-4094></i>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv4 Hardware ACL Configuration (accessed by running the command **access-list hardware (named hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **access-list hardware (named hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ip-hw-acl)#
```

Then use this command (and the other “named hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL. You can insert a new filter entry into the middle of an existing list by specifying the appropriate sequence number. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Then use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the access-list named “my-list” that will permit any IP packet with a source address of 192.168.1.1, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# permit ip 192.168.1.1/32 any
```

To add a filter entry to the access-list named “my-list” that will permit any IP packet with a source address of 192.168.1.1 and a MAC source address of ffee.ddcc.bbba, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# permit ip 192.168.1.1/32 any mac
    ffee.ddcc.bbba 0000.0000.0000 any
```

To add a filter entry to the access-list named “my-list” that will deny all IP packets on vlan 2, use the commands:

```
awplus# enable
awplus(config)# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# deny ip any any vlan 2
```

Related commands

- access-group**
- access-list hardware (named hardware ACL)**
- access-list hardware-deny-log**
- match access-group**
- show running-config**
- show access-list (IPv4 Hardware ACLs)**

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named hardware ACL entry for IP protocols)

Overview Use this command to add an IP protocol type filter entry to the current hardware access-list. The filter will match on IP packets that have the specified IP protocol number, and the specified IP and/or MAC addresses. You can use the value **any** instead of source or destination IP or MAC address if an address does not matter.

If you specify a sequence number, the switch inserts the new filter at the specified location. Otherwise, the switch adds the new filter to the end of the access-list.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny proto 2 192.168.0.0/16 any**).

You can find the sequence number by running the **show access-list (IPv4 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* proto *<1-255>* *<source-ip>* *<dest-ip>*
[*<source-mac>* *<dest-mac>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* proto *<1-255>* *<source-ip>* *<dest-ip>* [*<source-mac>*
<dest-mac>] [vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameters in IP protocol ACL entries

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
proto <i><1-255></i>	The IP protocol number to match against, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.
<i><source-ip></i>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
any	Match any source IP address.

Parameter	Description
dhcpsnooping	Match the source address learned from the DHCP Snooping binding database.
host <ip-addr>	Match a single source host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr>/<prefix>	Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<ip-addr> <reverse-mask>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<dest-ip>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <ip-addr>	Match a single destination host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr>/<prefix>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<ip-addr> <reverse-mask>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.

Parameter	Description
<source-mac>	The source MAC address to match against. You can specify a single MAC address, a range (through a mask), the address learned from DHCP snooping, or any:
	any Match against any source MAC address.
	<source-mac> The source MAC address to match against, followed by the mask. Enter the address in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
	dhcpsnooping Match the source address learned from the DHCP Snooping binding database.
<dest-mac>	The destination MAC address to match against. You can specify a single MAC address, a range (through a mask), or any:
	any Match against any destination MAC address.
	<dest-mac> The destination MAC address to match against, followed by the mask. Enter the address in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <HHHH.HHHH.HHHH>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)

Protocol Number	Protocol Description [RFC]
89	OSPFv2 [RFC1583]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode IPv4 Hardware ACL Configuration (accessed by running the command **access-list hardware (named hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, run the command **access-list hardware (named hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ip-hw-acl)#
```

Then use this command (and the other “named hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL. You can insert a new filter entry into the middle of an existing list by specifying the appropriate sequence number. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Then use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the access-list named “my-list” that will deny all IGMP packets (protocol 2) from the 192.168.0.0 subnet, and give it a sequence number of 50, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# 50 deny proto 2 192.168.0.0/16 any
```

Related commands

- [access-group](#)
- [access-list hardware \(named hardware ACL\)](#)
- [access-list hardware-deny-log](#)
- [match access-group](#)
- [show running-config](#)
- [show access-list \(IPv4 Hardware ACLs\)](#)

Command changes

Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named hardware ACL entry for MAC addresses)

Overview Use this command to add a MAC address filter entry to the current hardware access-list. The access-list will match on packets that have the specified source and destination MAC addresses. You can use the value **any** instead of source or destination MAC address if an address does not matter.

If you specify a sequence number, the switch inserts the new filter at the specified location. Otherwise, the switch adds the new filter to the end of the access-list.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no permit mac aaaa.bbbb.cccc 0000.0000.0000 any**).

You can find the sequence number by running the **show access-list (IPv4 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* mac {*<source-mac>*|any} {*<dest-mac>*|any} [vlan *<1-4094>*] [inner-vlan *<1-4094>*]
no *<sequence-number>*
no *<action>* mac {*<source-mac>*|any} {*<dest-mac>*|any} [vlan *<1-4094>*] [inner-vlan *<1-4094>*]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
mac	Match against MAC address
<i><source-mac></i>	The source MAC address to match against, followed by the mask. Enter the address in the format <i><HHHH.HHHH.HHHH></i> , where each <i>H</i> is a hexadecimal number. Enter the mask in the format <i><HHHH.HHHH.HHHH></i> , where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
any	Match against any source MAC address.

Parameter	Description
<code><dest-mac></code>	The destination MAC address to match against, followed by the mask. Enter the address in the format <code><HHHH.HHHH.HHHH></code>, where each <i>H</i> is a hexadecimal number. Enter the mask in the format <code><HHHH.HHHH.HHHH></code>, where each <i>H</i> is a hexadecimal number. For a mask, each value is either 0 or F, where FF = Ignore, and 00 = Match.
<code>any</code>	Match against any destination MAC address.
<code>vlan <1-4094></code>	Match against the specified ID in the packet's VLAN tag.
<code>inner-vlan <1-4094></code>	Match against the inner VLAN tag (VID). This parameter is used within double-tagged VLANs. It is sometimes referred to as the C-TAG (Customer VLAN TAG), and the vlan VID tag is referred to as the S-TAG (Service VLAN TAG).

Mode IPv4 Hardware ACL Configuration (accessed by running the command **access-list hardware (named hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **access-list hardware (named hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ip-hw-acl)#
```

Then use this command (and the other "named hardware ACL: entry" commands) to add filter entries. You can add multiple filter entries to an ACL. You can insert a new filter entry into the middle of an existing list by specifying the appropriate sequence number. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Then use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the access-list named “my-list” that will permit packets with a source MAC address of 0000.00ab.1234 and any destination MAC address, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# permit mac 0000.00ab.1234
0000.0000.0000 any
```

To remove a filter entry that permit packets with a source MAC address of 0000.00ab.1234 and any destination MAC address, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# no permit mac 0000.00ab.1234
0000.0000.0000 any
```

Related commands [access-group](#)
[access-list hardware \(named hardware ACL\)](#)
[match access-group](#)
[show running-config](#)
[show access-list \(IPv4 Hardware ACLs\)](#)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named hardware ACL entry for TCP or UDP)

Overview Use this command to add a TCP or UDP filter entry to the current hardware access-list. The access-list will match on TCP or UDP packets that have the specified source and destination IP addresses and optionally, port values. You can use the value **any** instead of source or destination IP address if an address does not matter.

If you specify a sequence number, the switch inserts the new filter at the specified location. Otherwise, the switch adds the new filter to the end of the access-list.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no permit udp 192.168.0.0/16 any**).

You can find the sequence number by running the **show access-list (IPv4 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* {tcp|udp} *<source-ip>* [*<source-ports>*] *<dest-ip>* [*<dest-ports>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* {tcp|udp} *<source-ip>* [*<source-ports>*] *<dest-ip>* [*<dest-ports>*] [vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
tcp	Match against TCP packets.
udp	Match against UDP packets.
<i><source-ip></i>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <i><ip-addr></i> Match a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.

Parameter	Description
<i><ip-addr>/<prefix></i>	Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr> <reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><source-ports></i>	Match source TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <i><0-65535></i>	Match a single port number.
lt <i><0-65535></i>	Match all port numbers that are less than the specified port number.
gt <i><0-65535></i>	Match all port numbers that are greater than the specified port number.
ne <i><0-65535></i>	Match all port numbers except the specified port number.
range <i><start-port> <end-port></i>	Match a range of port numbers.
<i><dest-ip></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/<prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.

Parameter	Description
<i><ip-addr> <reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ports></i>	Match destination TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <0-65535>	Match a single port number.
lt <0-65535>	Match all port numbers that are less than the specified port number.
gt <0-65535>	Match all port numbers that are greater than the specified port number.
ne <0-65535>	Match all port numbers except the specified port number.
range <start-port> <end-port>	Match a range of port numbers.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv4 Hardware ACL Configuration (accessed by running the command **access-list hardware (named hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **access-list hardware (named hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ip-hw-acl)#
```

Then use this command (and the other “named hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL. You can insert a new filter entry into the middle of an existing list by specifying the appropriate sequence number. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Then use the **access-group** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Example To add a filter entry to access-list named “my-list” that will permit TCP packets with a destination address of 192.168.1.1, a destination port of 80, from any source, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware my-list
awplus(config-ip-hw-acl)# permit tcp any 192.168.1.1/32 eq 80
```

Related commands

- access-group**
- access-list hardware (named hardware ACL)**
- access-list hardware-deny-log**
- match access-group**
- show running-config**
- show access-list (IPv4 Hardware ACLs)**

Command changes

Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

platform acls-to-vlanclassifiers

Overview Use this command to configure the amount of memory allocated (or split) between ACLs and VLAN classifiers.

Use the **no** variant of this command to reset the allocation to the default setting.

Syntax `platform acls-to-vlanclassifiers {more-vlan-classifiers | half-and-half | more-acls}`
`no platform acls-to-vlanclassifiers`

Parameter	Description
<code>more-vlan-classifiers</code>	Support more dynamic VLAN classifiers.
<code>half-and-half</code>	Support the same number of ACLs and VLAN classifiers.
<code>more-acls</code>	Support more ACLs.

Default More dynamic VLAN classifiers

Mode Global Configuration

Usage notes Access-lists and VLAN classifiers use the same memory/table in hardware. This command is used to split this memory to support more ACLs, more VLAN classifiers or the same number of ACLs and VLAN classifiers.

Note: For this command to take effect, you must copy it to the startup configuration using the **copy running-config startup-config** command and then reboot the switch.

Example To store more dynamic VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acs-to-vlanclassifiers more-vlan-
classifiers
```

To store the same number of ACLs and VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acs-to-vlanclassifiers half-and-half
```

To store more ACLs, use the following commands:

```
awplus# configure terminal
awplus(config)# platform acs-to-vlanclassifiers more-acls
```

To reset the allocation to the default settings, use the commands:

```
awplus# configure terminal
awplus(config)# no platform acs-to-vlanclassifiers
```

Related commands

- show platform**
- show platform classifier statistics utilization brief**
- show running-config**
- show startup-config**

Command changes

- Version 5.4.9-0.1: command added
- Version 5.5.0-0.1: **tunnel-support** parameter added for x530 series

show access-group

Overview Use this command to show the access-lists attached globally. If an access-list is specified, only that access-list will be displayed.

Syntax `show access-group [{<3000-3699>|<4000-4699>|<access-list-name>}]`

Parameter	Description
<3000-3699>	Specify a Hardware IP access-list.
<4000-4699>	Specify a Hardware MAC access-list.
<access-list-name>	Specify a Hardware IPv4 access-list name.

Mode User Exec and Privileged Exec

Example To show all access-lists attached globally:

```
awplus# show access-group
```

Output The following shows typical output.

Example output from show access-group

```
Global access control list
access-group 3000
access-group 4000
```

Related commands

- [access-group](#)
- [show access-list counters](#)
- [show interface access-group](#)

show access-list (IPv4 Hardware ACLs)

Overview Use this command to display the specified access-list, or all access-lists if none have been specified. Note that only defined access-lists are displayed. An error message is displayed for an undefined access-list.

Syntax `show access-list [<1-99>|<100-199>|<1300-1999>|<2000-2699>|<3000-3699>| <4000-4499>|<access-list-name>]`

Parameter	Description
<1-99>	IP standard access-list.
<100-199>	IP extended access-list.
<1300-1999>	IP standard access-list (standard - expanded range).
<2000-2699>	IP extended access-list (extended - expanded range).
<3000-3699>	Hardware IP access-list.
<4000-4499>	Hardware MAC access-list.
<access-list-name>	IP named access-list.

Mode User Exec and Privileged Exec

Examples To show all access-lists configured on the switch:

```
awplus# show access-list
```

```
Standard IP access list 1
  deny 172.16.2.0, wildcard bits 0.0.0.255
Standard IP access list 20
  deny 192.168.10.0, wildcard bits 0.0.0.255
  deny 192.168.12.0, wildcard bits 0.0.0.255
Hardware IP access list 3001
  permit ip 192.168.20.0 255.255.255.0 any
Hardware IP access list 3020
  permit tcp any 192.0.2.0/24
```

To show the access-list with an ID of 20:

```
awplus# show access-list 20
```

```
Standard IP access-list 20
  deny 192.168.10.0, wildcard bits 0.0.0.255
  deny 192.168.12.0, wildcard bits 0.0.0.255
```

ACLs that are added dynamically during port authentication will be displayed with the label 'dynamic':

```
awplus# show access-list
```

```
Hardware IP access list 3000
  4 permit ip any any
Hardware IP access list 3001
  4 deny ip 192.168.0.0/24 any
Hardware IP access list dacl-port1.0.49-eccd.6dc9.c0d2 (dynamic)
  4 permit ip 192.168.1.0/24 192.168.2.0/24
  8 deny ip 192.168.1.0/24 any
```

The following error message is displayed if you try to show an undefined access-list.

```
awplus# show access-list 2
```

```
% Can't find access-list 2
```

Related commands [access-list extended \(named\)](#)
[access-list \(numbered hardware ACL for MAC addresses\)](#)
[access-list hardware \(named hardware ACL\)](#)

show access-list counters

Overview Use this command to show the number of packets that match one or all of your hardware ACLs. Every time a hardware ACL allows or drops a packet, its counter increments. This lets you check your ACL configuration.

Syntax show access-list counters [<acl>]

Parameter	Description
<acl>	Display the number of packets that match only the specified ACL. You can enter the ACL name or number.

Mode User Exec and Privileged Exec

Usage notes This command displays the counter values since the last time they were cleared. To clear the counter values, enter the command **clear access-list counters**.

To accurately measure the number of packet hits per ACL, you need to read the counters for all ACLs frequently.

Example To show the number of packets that match all hardware ACLs, use the following command:

```
awplus# show access-list counters
```

Output The following shows typical output.

Example output from show access-list counters

```
awplus#show access-list counters
Hardware ACL Packet Counters

ACL-1
Packet Hits: 17
ACL-2
Packet Hits: 0
ACL-3
Packet Hits: 1
```

Output The following shows typical output.

Example output from show access-list counters ACL-1

```
awplus#show access-list counters ACL-1
Hardware ACL Packet Counters

ACL-1
Packet Hits: 17
```

Parameters in the output from show access-list counters

Parameter	Description
Packet Hits	The number of packets that match the ACL. The count includes both dropped and allowed packets.

Related commands [clear access-list counters](#)
[show access-group](#)
[show interface access-group](#)

Command changes Version 5.5.2-2.1: reading the counters no longer clears them
Version 5.5.1-2.1: command added

show acl-group ip address

Overview Use this command to show the hosts and subnets in a named IPv4 ACL group.

Syntax show acl-group ip address <group>

Parameter	Description
<group>	The name of the IPv4 ACL group.

Mode Privileged Exec

Example To show all hosts and subnets in an IPv4 ACL group IPV4_GROUP1, use the command:

```
awplus# show acl-group ip address IPV4_GROUP1
```

Output The following shows typical output.

Example output from show acl-group ip address IPV4_GROUP1

```
awplus#show acl-group ip address IPV4_GROUP1
Host Group: IPV4_GROUP1

192.168.1.2/32
192.168.2.5/32
10.0.0.0/8
```

Related commands [acl-group ip address](#)
[ip \(ip-host-group\)](#)

Command changes Version 5.5.0-1.1: command added

show acl-group ip port

Overview Use this command to show the port rules in a named port ACL group.

Syntax show acl-group ip port <group>

Parameter	Description
<group>	The name of the port ACL group.

Mode Privileged Exec

Example To show all port rules in a port ACL group PORT_GROUP1, use the command:

```
awplus# show acl-group ip port PORT_GROUP1
```

Output The following shows typical output.

Example output from show acl-group ip port PORT_GROUP1

```
awplus#show acl-group ip port PORT_GROUP1
Port Group: PORT_GROUP1

eq 11
gt 20
lt 503
ne 500
```

Related commands (acl-group ip port range)
acl-group ip port

Command changes Version 5.5.0-1.1: command added

show interface access-group

Overview Use this command to display the access groups attached to a port. If an access group is specified, then the output only includes the ports that the specified access group is attached to. If no access group is specified then this command displays all access groups that are attached to the ports that are specified with <port-list>.

Note that **access group** is the term given for an access-list when it is applied to an interface.

Syntax show interface <port-list> access-group [<3000-3699>|<4000-4699>]

Parameter	Description
<port-list>	Specify the ports to display information. A port-list can be either: • a switch port (e.g. port1.0.6) a static channel group (e.g. sa2) or a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen, e.g. port1.0.1-1.0.6 or port1.0.1-port1.0.6 or po1-po2 • a comma-separated list of ports and port ranges, e.g. port1.0.1,port1.0.3-1.0.6. Do not mix switch ports, static channel groups, and LACP channel groups in the same list.
access group	Select the access group whose details you want to show.
<3000-3699>	Specifies the Hardware IP access-list.
<4000-4699>	Specifies the Hardware MAC access-list.

Mode User Exec and Privileged Exec

Example To show all access-lists attached to port1.0.1, use the command:

```
awplus# show interface port1.0.1 access-group
```

Output The following shows typical output.

Example output from the show interface access-group command

```
Interface port1.0.1
  access-group 3000
  access-group 3002
  access-group 3001
```

Related **access-group**
commands **show access-group**

38

IPv4 Software Access Control List (ACL) Commands

- Contents**
- **Introduction** on page 1881
 - **access-list extended (named)** on page 1883
 - **access-list (extended numbered)** on page 1892
 - **(access-list extended ICMP filter)** on page 1895
 - **(access-list extended IP filter)** on page 1898
 - **(access-list extended IP protocol filter)** on page 1902
 - **(access-list extended TCP UDP filter)** on page 1907
 - **access-list standard (named)** on page 1911
 - **access-list (standard numbered)** on page 1913
 - **(access-list standard named filter)** on page 1915
 - **(access-list standard numbered filter)** on page 1917
 - **clear ip prefix-list** on page 1919
 - **dos** on page 1920
 - **ip prefix-list** on page 1924
 - **maximum-access-list (deleted)** on page 1926
 - **show access-list (IPv4 Software ACLs)** on page 1927
 - **show dos interface** on page 1929
 - **show ip access-list** on page 1932
 - **show ip prefix-list** on page 1933
 - **vty access-class (numbered)** on page 1934

Introduction

Overview This chapter provides an alphabetical reference for the IPv4 Software Access Control List (ACL) commands, and contains detailed command information and command examples about IPv4 software ACLs as applied to Routing and Multicasting, which are not applied to interfaces.

For information about ACLs, see the [ACL Feature Overview and Configuration Guide](#).

To apply ACLs to an LACP channel group, apply it to all the individual switch ports in the channel group. To apply ACLs to a static channel group, apply it to the static channel group itself. For more information on link aggregation see the following references:

- the [Link Aggregation Feature Overview_and_Configuration_Guide](#).
- [Link Aggregation Commands](#)

NOTE: Text in parenthesis in command names indicates usage not keyword entry. For example, indicates named IPv4 hardware ACLs entered as <> where <> is a placeholder not a keyword.

Parenthesis surrounding ACL filters indicates the type of ACL filter not the keyword entry in the CLI, such as (**access-list standard numbered filter**) represents command entry in the format shown in the syntax:

```
[<sequence-number>] {deny|permit} {<source-address>|host <host-address>|any}
```

denyexplicitly permitted

Sub-modes Many of the ACL commands operate from sub-modes that are specific to particular ACL types. The following table shows the CLI prompts at which ACL commands are entered.

IPv4 Software Access List Commands and Prompts

Command Name	Command Mode	Prompt
clear ip prefix-list	Privileged Exec	awplus#
show ip access-list	Privileged Exec	awplus#
show ip prefix-list	Privileged Exec	awplus#
access-group	Global Configuration	awplus(config)#
access-list (extended named)	Global Configuration	awplus(config)#
access-list (extended numbered)	Global Configuration	awplus(config)#
access-list (standard named)	Global Configuration	awplus(config)#
access-list (standard numbered)	Global Configuration	awplus(config)#
ip prefix-list	Global Configuration	awplus(config)#
maximum-access-list	Global Configuration	awplus(config)#
(access-list extended ICMP filter)	IPv4 Extended ACL Configuration	awplus(config-ip-ext-acl)#
(access-list extended IP filter)	IPv4 Extended ACL Configuration	awplus(config-ip-ext-acl)#
(access-list extended IP protocol filter)	IPv4 Extended ACL Configuration	awplus(config-ip-ext-acl)#
(access-list extended TCP UDP filter)	IPv4 Extended ACL Configuration	awplus(config-ip-ext-acl)#
(access-list standard named filter)	IPv4 Standard ACL Configuration	awplus(config-ip-std-acl)#
(access-list standard numbered filter)	IPv4 Standard ACL Configuration	awplus(config-ip-std-acl)#

access-list extended (named)

Overview This command configures an extended named access-list that permits or denies packets from specific source and destination IP addresses. You can:

- use this command to enter a new or existing ACL name and enter the IPv4 Extended ACL Configuration mode. Once in that mode, you can create an ACL filter entry. This approach lets you give the entry a sequence number.
- or, use this command to create an ACL and an ACL filter entry at the same time. With this approach, you cannot give the entry a sequence number, so the entry will go after any existing entries.

The **no** variant of this command removes a specified extended named access-list.

Syntax [to enter the sub-mode] access-list extended *<list-name>*
no access-list extended *<list-name>*

Parameter	Description
<i><list-name></i>	A user-defined name for the access-list

Syntax [icmp] access-list extended <list-name> {deny|permit} icmp <source>
<destination> [icmp-type <type-number>] [log]
no access-list extended <list-name> {deny|permit} icmp <source>
<destination> [icmp-type <type-number>] [log]

Parameters in the access-list extended (named) command - icmp

Parameter	Description
<list-name>	A user-defined name for the access-list.
deny	The access-list rejects packets that match the type, source, and destination filtering specified with this command.
permit	The access-list permits packets that match the type, source, and destination filtering specified with this command.
icmp	The access-list matches only ICMP packets.
icmp-type	Matches only a specified type of ICMP messages. This is valid only when the filtering is set to match ICMP packets.
<source>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source:
	any Matches any source IP address.
	host <ip-addr> Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.
	<ip-addr>/<prefix> An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.
	<ip-addr><reverse-mask> Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.
<destination>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination:
	any Matches any destination IP address.

Parameter	Description
host <ip-addr>	Matches a single destination host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr>/ <prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.
<ip-addr> <reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.
<type-number>	The ICMP type, as defined in RFC792 and RFC950. Specify one of the following integers to create a filter for the ICMP message type:
0	Echo replies.
3	Destination unreachable messages.
4	Source quench messages.
5	Redirect (change route) messages.
8	Echo requests.
11	Time exceeded messages.
12	Parameter problem messages.
13	Timestamp requests.
14	Timestamp replies.
15	Information requests.
16	Information replies.
17	Address mask requests.
18	Address mask replies.
log	Logs the results.

Syntax [tcp|udp] access-list extended <list-name> {deny|permit} {tcp|udp}
<source> [eq <sourceport>|lt <sourceport>|gt <sourceport>|ne
<sourceport>] <destination> [eq <destport>|lt <destport>|gt
<destport>|ne <destport>] [log]
no access-list extended <list-name> {deny|permit} {tcp|udp}
<source> [eq <sourceport>|lt <sourceport>|gt <sourceport>|ne
<sourceport>] <destination> [eq <destport> |lt <destport>|gt
<destport>|ne <destport>][log]

Parameters in the access-list extended (named) command - tcp|udp

Parameter	Description								
<list-name>	A user-defined name for the access-list.								
deny	The access-list rejects packets that match the type, source, and destination filtering specified with this command.								
permit	The access-list permits packets that match the type, source, and destination filtering specified with this command.								
tcp	The access-list matches only TCP packets.								
udp	The access-list matches only UDP packets.								
<source>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source: <table border="1"> <tr> <td>any</td><td>Matches any source IP address.</td></tr> <tr> <td>host <ip-addr></td><td>Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.</td></tr> <tr> <td><ip-addr>/<prefix></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.</td></tr> <tr> <td><ip-addr><reverse-mask></td><td>Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.</td></tr> </table>	any	Matches any source IP address.	host <ip-addr>	Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.	<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.	<ip-addr><reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.
any	Matches any source IP address.								
host <ip-addr>	Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.								
<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.								
<ip-addr><reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.								
<destination>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination:								

Parameter	Description
	any Matches any destination IP address.
	host <i><ip-addr></i> Matches a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
	<i><ip-addr>/<prefix></i> An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.
	<i><ip-addr><reverse-mask></i> Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.
<i><sourceport></i>	The source port number, specified as an integer between 0 and 65535.
<i><destport></i>	The destination port number, specified as an integer between 0 and 65535.
eq	Matches port numbers equal to the port number specified immediately after this parameter.
lt	Matches port numbers less than the port number specified immediately after this parameter.
gt	Matches port numbers greater than the port number specified immediately after this parameter.
ne	Matches port numbers not equal to the port number specified immediately after this parameter.
log	Log the results.

Syntax access-list extended <list-name> {deny|permit} {proto <ip-protocol>|any|ip} {<source>} {<destination>} [log]
[proto|any|ip] no access-list extended <list-name>{deny|permit} {proto <ip-protocol>|any|ip}{<source>}{<destination>}[log]

Parameters in the access-list extended (named) command - proto|ip|any

Parameter	Description								
<list-name>	A user-defined name for the access-list.								
deny	The access-list rejects packets that match the type, source, and destination filtering specified with this command.								
permit	The access-list permits packets that match the type, source, and destination filtering specified with this command.								
proto	Matches only a specified type of IP Protocol.								
any	The access-list matches any type of IP packet.								
ip	The access-list matches only IP packets.								
<source>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source: <table> <tr> <td>any</td><td>Matches any source IP address.</td></tr> <tr> <td>host <ip-addr></td><td>Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.</td></tr> <tr> <td><ip-addr>/<prefix></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.</td></tr> <tr> <td><ip-addr><reverse-mask></td><td>Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.10.0.0.255 is the same as entering 192.168.1.1/24.</td></tr> </table>	any	Matches any source IP address.	host <ip-addr>	Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.	<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.	<ip-addr><reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.10.0.0.255 is the same as entering 192.168.1.1/24.
any	Matches any source IP address.								
host <ip-addr>	Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.								
<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.								
<ip-addr><reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.10.0.0.255 is the same as entering 192.168.1.1/24.								
<destination>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination: <table> <tr> <td>any</td><td>Matches any destination IP address.</td></tr> </table>	any	Matches any destination IP address.						
any	Matches any destination IP address.								

Parameter	Description
host <ip-addr>	Matches a single destination host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr>/ <prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.
<ip-addr> <reverse-mask>	Alternatively, you can enter a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24.
log	Logs the results.
<ip-protocol>	The IP protocol number, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]

Protocol Number	Protocol Description [RFC]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)
89	OSPFIGP [RFC1583]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage Use this command when configuring access-lists for filtering IP software packets.

You can either create access-lists from within this command, or you can enter **access-list extended** followed by only the name. Entering only the name moves you to the IPv4 Extended ACL Configuration mode for the selected access-list. From there you can configure your access-lists by using the commands **(access-list extended ICMP filter)**, **(access-list extended IP filter)**, and **(access-list extended IP protocol filter)**.

Note that packets must match both the source and the destination details.

NOTE:

Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.

Examples You can enter the extended named ACL in the Global Configuration mode together with the ACL filter entry on the same line, as shown below:

```
awplus# configure terminal
awplus(config)# access-list extended TK deny tcp 2.2.2.3/24 eq
14 3.3.3.4/24 eq 12 log
```

Alternatively, you can enter the extended named ACL in Global Configuration mode before specifying the ACL filter entry in the IPv4 Extended ACL Configuration mode, as shown below:

```
awplus# configure terminal
awplus(config)# access-list extended TK
awplus(config-ip-ext-acl)# deny tcp 2.2.2.3/24 eq 14 3.3.3.4/24
eq 12 log
```

Related commands **(access-list extended ICMP filter)**
(access-list extended IP filter)
(access-list extended TCP UDP filter)
show access-group
show interface access-group
show ip access-list
show running-config

access-list (extended numbered)

Overview This command configures an extended numbered access-list that permits or denies packets from specific source and destination IP addresses. You can:

- use this command to enter a new or existing ACL number and enter the IPv4 Extended ACL Configuration mode. Once in that mode, you can create an ACL filter entry. This approach lets you give the entry a sequence number.
- or, use this command to create an ACL and an ACL filter entry at the same time. With this approach, you cannot give the entry a sequence number, so the entry will go after any existing entries.

The **no** variant of this command removes a specified extended named access-list.

Syntax [to enter the sub-mode]

```
access-list {<100-199>|<2000-2699>}  
no access-list {<100-199>|<2000-2699>}
```


Syntax [to create an ACL entry] `access-list {<100-199>|<2000-2699>} {deny|permit} ip <source> <destination>`
`no access-list {<100-199>|<2000-2699>} {deny|permit} ip <source> <destination>`

Parameter	Description
<100-199>	IP extended access-list.
<2000-2699>	IP extended access-list (expanded range).
deny	Access-list rejects packets that match the source and destination filtering specified with this command.
permit	Access-list permits packets that match the source and destination filtering specified with this command.
<source>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source:
any	Matches any source IP address.
host <ip-addr>	Matches a single source host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr> <reverse-mask>	An IPv4 address, followed by a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24. This matches any source IP address within the specified subnet.
<destination>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination:
any	Matches any destination IP address.
host <ip-addr>	Matches a single destination host with the IP address given by <ip-addr> in dotted decimal notation.
<ip-addr> <reverse-mask>	An IPv4 address, followed by a reverse mask in dotted decimal format. For example, entering 192.168.1.1 0.0.0.255 is the same as entering 192.168.1.1/24. This matches any destination IP address within the specified subnet.

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use this command when configuring access-list for filtering IP software packets.

You can either create access-lists from within this command, or you can enter **access - list** followed by only the number. Entering only the number moves you to the IPv4 Extended ACL Configuration mode for the selected access-list. From there you can configure your access-lists by using the commands **(access-list extended ICMP filter)**, **(access-list extended IP filter)**, and **(access-list extended IP protocol filter)**.

Note that packets must match both the source and the destination details.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples You can enter the extended ACL in the Global Configuration mode together with the ACL filter entry on the same line, as shown below:

```
awplus# configure terminal
awplus(config)# access-list 101 deny ip 172.16.10.0 0.0.0.255
any
```

Alternatively, you can enter the extended ACL in Global Configuration mode before specifying the ACL filter entry in the IPv4 Extended ACL Configuration mode, as shown below:

```
awplus# configure terminal
awplus(config)# access-list 101
awplus(config-ip-ext-acl)# deny ip 172.16.10.0 0.0.0.255 any
```

Related commands **(access-list extended ICMP filter)**
(access-list extended IP filter)
(access-list extended TCP UDP filter)
show access-group
show interface access-group
show ip access-list
show running-config

(access-list extended ICMP filter)

Overview Use this ACL filter to add a new ICMP filter entry to the current extended access-list. If the sequence number is specified, the new filter is inserted at the specified location. Otherwise, the new filter is added at the end of the access-list.

The **no** variant of this command removes an ICMP filter entry from the current extended access-list. You can specify the ICMP filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its ICMP filter profile without specifying its sequence number.

Note that the sequence number can be found by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [icmp] [*<sequence-number>*] {deny|permit} icmp *<source>* *<destination>*
[icmp-type *<icmp-value>*] [log]
no {deny|permit} icmp *<source>* *<destination>*[icmp-type *<icmp-value>*] [log]
no *<sequence-number>*

Parameter	Description				
<i><sequence-number></i>	<1-65535> The sequence number for the filter entry of the selected access control list.				
deny	Access-list rejects packets that match the source and destination filtering specified with this command.				
permit	Access-list permits packets that match the source and destination filtering specified with this command.				
icmp	ICMP packet type.				
<i><source></i>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source: <table> <tr> <td><i><ip-addr>/<prefix></i></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.</td></tr> <tr> <td>any</td><td>Matches any source IP address.</td></tr> </table>	<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.	any	Matches any source IP address.
<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.				
any	Matches any source IP address.				
<i><destination></i>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination: <table> <tr> <td><i><ip-addr>/<prefix></i></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.</td></tr> <tr> <td>any</td><td>Matches any destination IP address.</td></tr> </table>	<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.	any	Matches any destination IP address.
<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.				
any	Matches any destination IP address.				
icmp-type	The ICMP type.				
<i><icmp-value></i>	The value of the ICMP type.				
log	Log the results.				

Mode IPv4 Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *The access control list being configured is selected by running the command or the command, with the required access control list number, or name - but with no further parameters selected.*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Examples To add a new entry in access-list called 'my-list' that will reject ICMP packets from 10.0.0.1 to 192.168.1.1, use the commands:

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# deny icmp 10.0.0.1/32 192.168.1.1/32
```

Use the following commands to add a new filter at sequence number 5 position of the access-list called 'my-list'. The filter will accept the ICMP type 8 packets from 10.1.1.0/24 network, to 192.168.1.0 network:

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# 5 permit icmp 10.1.1.0/24
192.168.1.0/24 icmp-type 8
```

Related commands

- access-group**
- show access-group**
- show interface access-group**
- show running-config**
- show ip access-list**

(access-list extended IP filter)

Overview Use this ACL filter to add a new IP filter entry to the current extended access-list. If the sequence number is specified, the new filter is inserted at the specified location. Otherwise, the new filter is added at the end of the access-list.

The **no** variant of this command removes an IP filter entry from the current extended access-list. You can specify the IP filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its IP filter profile without specifying its sequence number.

Note that the sequence number can be found by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [ip] [*<sequence-number>*] {deny|permit} ip *<source>* *<destination>*
no {deny|permit} ip *<source>* *<destination>*
no *<sequence-number>*

Parameter	Description						
<i><sequence-number></i>	<1-65535> The sequence number for the filter entry of the selected access control list.						
deny	Access-list rejects packets that match the source and destination filtering specified with this command.						
permit	Access-list permits packets that match the source and destination filtering specified with this command.						
<i><source></i>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source: <table> <tr> <td>any</td><td>Matches any source IP address.</td></tr> <tr> <td>host <i><ip-addr></i></td><td>Matches a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.</td></tr> <tr> <td><i><ip-addr></i> <i><reverse-mask></i></td><td>Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.</td></tr> </table>	any	Matches any source IP address.	host <i><ip-addr></i>	Matches a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.	<i><ip-addr></i> <i><reverse-mask></i>	Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.
any	Matches any source IP address.						
host <i><ip-addr></i>	Matches a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.						
<i><ip-addr></i> <i><reverse-mask></i>	Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.						
<i><destination></i>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination: <table> <tr> <td>any</td><td>Matches any destination IP address.</td></tr> <tr> <td>host <i><ip-addr></i></td><td>Matches a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.</td></tr> <tr> <td><i><ip-addr></i> <i><reverse-mask></i></td><td>Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.</td></tr> </table>	any	Matches any destination IP address.	host <i><ip-addr></i>	Matches a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.	<i><ip-addr></i> <i><reverse-mask></i>	Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.
any	Matches any destination IP address.						
host <i><ip-addr></i>	Matches a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.						
<i><ip-addr></i> <i><reverse-mask></i>	Alternatively, enter an IPv4 address followed by a reverse mask in dotted decimal format. For example, enter 192.168.1.1 0.0.0.255.						

Mode Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *The access control list being configured is selected by running the command or the command, with the required access control list number, or name - but with no further parameters selected.*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Example 1 First use the following commands to enter the IPv4 Extended ACL
[list-number] Configuration mode and define a numbered extended access-list 101:

```
awplus# configure terminal
awplus(config)# access-list 101
awplus(config-ip-ext-acl)#
```

Then use the following commands to add a new entry to the numbered extended access-list 101 that will reject packets from 10.0.0.1 to 192.168.1.1:

```
awplus(config-ip-ext-acl)# deny ip host 10.0.0.1 host
192.168.1.1
awplus(config-ip-ext-acl)# 20 permit ip any any
```

Example 2 First use the following commands to enter the IPv4 Extended ACL
[list-name] Configuration mode and define a named access-list called 'my-acl':

```
awplus# configure terminal
awplus(config)# access-list extended my-acl
awplus(config-ip-ext-acl)#
```

Then use the following commands to add a new entry to the named access-list 'my-acl' that will reject packets from 10.0.0.1 to 192.168.1.1:

```
awplus(config-ip-ext-acl)# deny ip host 10.0.0.1 host
192.168.1.1
awplus(config-ip-ext-acl)# 20 permit ip any any
```

Example 3 Use the following commands to remove the access-list filter entry with
[list-number] sequence number 20 from extended numbered access-list 101.

```
awplus# configure terminal
awplus(config)# access-list 101
awplus(config-ip-ext-acl)# no 20
```


Example 4 Use the following commands to remove the access-list filter entry with sequence number 20 from extended named access-list my-acl:

[list-name]

```
awplus# configure terminal
awplus(config)# access-list extended my-acl
awplus(config-ip-ext-acl)# no 20
```

Related commands

- access-list extended (named)**
- access-list (extended numbered)**
- show access-group**
- show interface access-group**
- show ip access-list**
- show running-config**

(access-list extended IP protocol filter)

Overview Use this ACL filter to add a new IP protocol type filter entry to the current extended access-list. If the sequence number is specified, the new filter is inserted at the specified location. Otherwise, the new filter is added at the end of the access-list.

The **no** variant of this command removes an IP protocol filter entry from the current extended access-list. You can specify the IP filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its IP filter profile without specifying its sequence number.

Note that the sequence number can be found by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [*<sequence-number>*] {deny|permit} proto *<ip-protocol>* *<source>*
[proto] *<destination>* [log]
 no {deny|permit} proto *<ip-protocol>* *<source>* *<destination>*
 [log]
 no *<sequence-number>*

Parameter	Description				
<sequence-number>	<1-65535> The sequence number for the filter entry of the selected access control list.				
deny	Access-list rejects packets that match the source and destination filtering specified with this command.				
permit	Access-list permits packets that match the source and destination filtering specified with this command.				
proto <ip-protocol>	<1-255> Specify IP protocol number, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.				
<source>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source: <table><tr><td><ip-addr>/<prefix></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.</td></tr><tr><td>any</td><td>Matches any source IP address.</td></tr></table>	<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.	any	Matches any source IP address.
<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.				
any	Matches any source IP address.				
<destination>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination: <table><tr><td><ip-addr>/<prefix></td><td>An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.</td></tr><tr><td>any</td><td>Matches any destination IP address.</td></tr></table>	<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.	any	Matches any destination IP address.
<ip-addr>/<prefix>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.				
any	Matches any destination IP address.				
log	Log the results.				

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)

Protocol Number	Protocol Description [RFC]
89	OSPFv2 [RFC1583]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode IPv4 Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *The access control list being configured is selected by running the command or the command, with the required access control list number, or name - but with no further parameters selected.*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Example 1 Use the following commands to add a new access-list filter entry to the access-list named 'my-list' that will reject IP packets from source address 10.10.1.1/32 to destination address 192.68.1.1/32:

[creating a list]

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# deny ip 10.10.1.1/32 192.68.1.1/32
```

Example 2 Use the following commands to add a new access-list filter entry at sequence position 5 in the access-list named 'my-list' that will accept packets from source address 10.10.1.1/24 to destination address 192.68.1.1/24:

[adding to a list]

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# 5 permit ip 10.10.1.1/24
192.68.1.1/24
```

Related commands

- access-list extended (named)**
- access-list (extended numbered)**
- show access-group**
- show interface access-group**
- show ip access-list**
- show running-config**

(access-list extended TCP UDP filter)

Overview Use this ACL filter to add a new TCP or UDP filter entry to the current extended access-list. If the sequence number is specified, the new filter is inserted at the specified location. Otherwise, the new filter is added at the end of the access-list.

The **no** variant of this command removes a TCP or UDP filter entry from the current extended access-list. You can specify the TCP or UDP filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its TCP or UDP filter profile without specifying its sequence number.

Note that the sequence number can be found by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [tcp|udp] [*<sequence-number>*] {deny|permit} {tcp|udp} *<source>* {eq *<sourceport>* |lt *<sourceport>*|gt *<sourceport>*|ne *<sourceport>*} *<destination>* [eq *<destport>*|lt *<destport>*|gt *<destport>*|ne *<destport>*] [log]

no [*<sequence-number>*] {deny|permit} {tcp|udp} *<source>* {eq *<sourceport>* |lt *<sourceport>*|gt *<sourceport>*|ne *<sourceport>*} *<destination>* [eq *<destport>*|lt *<destport>*|gt *<destport>*|ne *<destport>*] [log]

no *<sequence-number>*

Parameter	Description	
<i><sequence-number></i>	<1-65535> The sequence number for the filter entry of the selected access control list.	
deny	Access-list rejects packets that match the source and destination filtering specified with this command.	
permit	Access-list permits packets that match the source and destination filtering specified with this command.	
tcp	The access-list matches only TCP packets.	
udp	The access-list matches only UDP packets.	
<i><source></i>	The source address of the packets. You can specify a single host, a subnet, or all sources. The following are the valid formats for specifying the source:	
	<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any source IP address within the specified subnet.
	any	Matches any source IP address.
<i><sourceport></i>	The source port number, specified as an integer between 0 and 65535.	
<i><destination></i>	The destination address of the packets. You can specify a single host, a subnet, or all destinations. The following are the valid formats for specifying the destination:	
	<i><ip-addr>/<prefix></i>	An IPv4 address, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.
	any	Matches any destination IP address.

Parameter	Description
<destport>	The destination port number, specified as an integer between 0 and 65535.
eq	Matches port numbers equal to the port number specified immediately after this parameter.
lt	Matches port numbers less than the port number specified immediately after this parameter.
gt	Matches port numbers greater than the port number specified immediately after this parameter.
ne	Matches port numbers not equal to the port number specified immediately after this parameter.
log	Log the results.

Mode IPv4 Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *access-list (extended numbered)access-list extended (named)*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Example 1 To add a new entry to the access-list named 'my-list' that will reject TCP
[creating a list] packets from 10.0.0.1 on TCP port 10 to 192.168.1.1 on TCP port 20, use the commands:

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# deny tcp 10.0.0.1/32 eq 10
192.168.1.1/32 eq 20
```

Example 2 To insert a new entry with sequence number 5 into the access-list named 'my-list' that will accept UDP packets from 10.1.1.0/24 network to 192.168.1.0/24 network on UDP port 80, use the commands:

```
awplus# configure terminal
awplus(config)# access-list extended my-list
awplus(config-ip-ext-acl)# 5 permit udp 10.1.1.0/24
192.168.1.0/24 eq 80
```

Related commands

- access-list extended (named)**
- access-list (extended numbered)**
- show access-group**
- show interface access-group**
- show ip access-list**
- show running-config**

access-list standard (named)

Overview This command configures a standard named access-list that permits or denies packets from a specific source IP address. You can:

- use this command to enter a new or existing ACL name and enter the IPv4 Standard ACL Configuration mode. Once in that mode, you can create an ACL filter entry using the command (**access-list standard named filter**). This approach lets you give the entry a sequence number.
- or, use this command to create an ACL and an ACL filter entry at the same time. With this approach, you cannot give the entry a sequence number, so the entry will go after any existing entries.

The **no** variant of this command removes a specified standard named access-list.

Syntax [to enter the sub-mode] `access-list standard <standard-acl-name>`
`no access-list standard <standard-acl-name>`

Syntax [to create an ACL entry] `access-list standard <standard-acl-name> {deny|permit} {any|<ip-addr>/<prefix>}`
`no access-list standard <standard-acl-name> {deny|permit} {any|<ip-addr>/<prefix>}`

Parameter	Description
<code><standard-acl-name></code>	Specify a name for the standard access-list.
<code>deny</code>	The access-list rejects packets that match the source filtering specified with this command.
<code>permit</code>	The access-list permits packets that match the source filtering specified with this command.
<code>any</code>	Match any source IP address.
<code><ip-addr>/<prefix></code>	Match the source address of the packets. Specify an IPv4 address in dotted decimal format, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use this command when configuring a standard named access-list for filtering IP software packets.

You can either create access-lists from within this command, or you can enter **access-list standard** followed by only the name. Entering only the name moves you to the IPv4 Standard ACL Configuration mode for the selected access-list. From there you can configure your access-lists by using the command **(access-list standard named filter)**.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples To define a standard access-list named 'my-list' and deny any packets from any source, use the commands:

```
awplus# configure terminal
awplus(config)# access-list standard my-list deny any
```

Alternatively, to define a standard access-list named 'my-list' and enter the IPv4 Standard ACL Configuration mode, and then create ACL entry 5 to deny any packets from any source, use the commands:

```
awplus# configure terminal
awplus(config)# access-list standard my-list
awplus(config-ip-std-acl)# 5 deny any
```

Related commands **(access-list standard named filter)**
show access-group
show interface access-group
show ip access-list
show running-config

access-list (standard numbered)

Overview This command configures a standard numbered access-list that permits or denies packets from a specific source IP address. You can:

- use this command to enter a new or existing ACL number and enter the IPv4 Standard ACL Configuration mode. Once in that mode, you can create an ACL filter entry using the command (**access-list standard numbered filter**). This approach lets you give the entry a sequence number.
- or, use this command to create an ACL and an ACL filter entry at the same time. With this approach, you cannot give the entry a sequence number, so the entry will go after any existing entries.

The **no** variant of this command removes a specified standard numbered access-list.

Syntax [to enter the sub-mode]

```
access-list {<1-99>|<1300-1999>}  
no access-list {<1-99>|<1300-1999>}
```

Syntax [to create an ACL entry]

```
access-list {<1-99>|<1300-1999>} {deny|permit} <source>  
no access-list {<1-99>|<1300-1999>} {deny|permit} <source>
```

Parameter	Description								
<1-99>	IP standard access-list.								
<1300-1999>	IP standard access-list (expanded range).								
deny	Access-list rejects packets from the specified source.								
permit	Access-list accepts packets from the specified source.								
<source>	The source address of the packets. The following are the valid formats for specifying the source: <table><tr><td><ip-addr> <reverse-mask></td><td>A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).</td></tr><tr><td><ip-addr></td><td>A single source address to match. The source address is specified in dotted decimal format.</td></tr><tr><td>host <ip-addr></td><td>A single source address to match. The source address is specified in dotted decimal format.</td></tr><tr><td>any</td><td>Any source address.</td></tr></table>	<ip-addr> <reverse-mask>	A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).	<ip-addr>	A single source address to match. The source address is specified in dotted decimal format.	host <ip-addr>	A single source address to match. The source address is specified in dotted decimal format.	any	Any source address.
<ip-addr> <reverse-mask>	A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).								
<ip-addr>	A single source address to match. The source address is specified in dotted decimal format.								
host <ip-addr>	A single source address to match. The source address is specified in dotted decimal format.								
any	Any source address.								

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use this command when configuring a standard numbered access-list for filtering IP software packets.

You can either create access-lists from within this command, or you can enter **access-list** followed by only the number. Entering only the number moves you to the IPv4 Standard ACL Configuration mode for the selected access-list. From there you can configure your access-lists by using the command **(access-list standard numbered filter)**.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples To create ACL number 67 that will deny packets from subnet 172.16.10.0, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 67 deny 172.16.10.0 0.0.0.255
```

Alternatively, to define ACL number 67 and enter the IPv4 Standard ACL Configuration mode, and then create ACL entry 5 to deny any packets from subnet 172.16.10.0, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 67
awplus(config-ip-std-acl)# 5 deny 172.16.10.0 0.0.0.255
```

Related commands **(access-list standard numbered filter)**
show access-group
show interface access-group
show ip access-list
show running-config

(access-list standard named filter)

Overview This ACL filter adds a source IP address filter entry to a current named standard access-list. If the sequence number is specified, the new filter entry is inserted at the specified location. Otherwise, the new entry is added at the end of the access-list.

The **no** variant of this command removes a source IP address filter entry from the current named standard access-list. You can specify the source IP address filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its source IP address filter profile without specifying its sequence number (e.g. **no deny any**).

Note that you can find the sequence number by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [*<sequence-number>*] {deny|permit} {any|*<ip-addr>/<prefix>*
[exact-match]}
no *<sequence-number>*
no {deny|permit} {any|*<ip-addr>/<prefix>* [exact-match]}

Parameter	Description
<i><sequence-number></i>	<1-65535> The sequence number for the filter entry of the selected access control list.
deny	Access-list rejects packets of the source filtering specified.
permit	Access-list allows packets of the source filtering specified
any	Match any source IP address.
<i><ip-addr>/<prefix></i>	Match the source address of the packets. Specify an IPv4 address in dotted decimal format, followed by a forward slash, then the prefix length. This matches any destination IP address within the specified subnet.
exact-match	Specify an exact IP prefix to match on.

Mode IPv4 Standard ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *The access control list being configured is selected by running the command with the required access control list name, but with no further parameters selected.*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Examples Use the following commands to add a new filter entry to access-list 'my-list' that will reject IP address 10.1.1.1:

```
awplus# configure terminal
awplus(config)# access-list standard my-list
awplus(config-ip-std-acl)# deny 10.1.1.1/32
```

Use the following commands to insert a new filter entry into access-list 'my-list' at sequence position number 15 that will accept IP network 10.1.2.0:

```
awplus# configure terminal
awplus(config)# access-list standard my-list
awplus(config-ip-std-acl)# 15 permit 10.1.2.0/24
```

Related commands

- access-list standard (named)**
- show access-group**
- show interface access-group**
- show ip access-list**
- show running-config**

(access-list standard numbered filter)

Overview This ACL filter adds a source IP address filter entry to a current standard numbered access-list. If a sequence number is specified, the new filter entry is inserted at the specified location. Otherwise, the new filter entry is added at the end of the access-list.

The **no** variant of this command removes a source IP address filter entry from the current standard numbered access-list. You can specify the source IP address filter entry for removal by entering either its sequence number (e.g. **no 10**), or by entering its source IP address filter profile without specifying its sequence number.

Note that the sequence number can be found by running the **show access-list (IPv4 Software ACLs)** command.

Syntax [*<sequence-number>*] {deny|permit} *<source>*
no {deny|permit} *<source>*
no *<sequence-number>*

Parameter	Description								
<i><sequence-number></i>	<i><1-65535></i> The sequence number for the filter entry of the selected access control list.								
deny	Access-list rejects packets of the type specified.								
permit	Access-list allows packets of the type specified								
<i><source></i>	The source address of the packets. The following are the valid formats for specifying the source: <table><tr><td><i><ip-addr></i> <i><reverse-mask></i></td><td>A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).</td></tr><tr><td><i><ip-addr></i></td><td>A single source address to match. The source address is specified in dotted decimal format.</td></tr><tr><td>host <i><ip-addr></i></td><td>A single source address to match. The source address is specified in dotted decimal format.</td></tr><tr><td>any</td><td>Any source address.</td></tr></table>	<i><ip-addr></i> <i><reverse-mask></i>	A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).	<i><ip-addr></i>	A single source address to match. The source address is specified in dotted decimal format.	host <i><ip-addr></i>	A single source address to match. The source address is specified in dotted decimal format.	any	Any source address.
<i><ip-addr></i> <i><reverse-mask></i>	A source subnet, specified by entering the address and a reverse mask in dotted decimal format. For example, 192.168.1.0 0.0.0.255 (equivalent to 192.168.1.0/24).								
<i><ip-addr></i>	A single source address to match. The source address is specified in dotted decimal format.								
host <i><ip-addr></i>	A single source address to match. The source address is specified in dotted decimal format.								
any	Any source address.								

Mode IPv4 Standard ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes An ACL can be configured with multiple ACL filters using sequence numbers. If the sequence number is omitted, the next available multiple of 4 will be used as the sequence number for the new filter. A new ACL filter can be inserted into the middle of an existing list by specifying the appropriate sequence number.

NOTE: *The access control list being configured is selected by running the command with the required access control list number but with no further parameters selected.*

*Software ACLs will **deny** access unless **explicitly permitted** by an ACL action.*

Example To add a new entry accepting the IP network 10.1.1.0/24 at the sequence number 15 position, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 99
awplus(config-ip-std-acl)# 15 permit 10.1.2.0 0.0.0.255
```

Related commands **access-list (standard numbered)**
show access-group
show interface access-group
show ip access-list
show running-config

clear ip prefix-list

Overview Use this command to reset the hit count to zero in the prefix-list entries.

Syntax `clear ip prefix-list [<list-name>] [<ip-address>/<mask>]`

Parameter	Description
<list-name>	The name of the prefix-list.
<ip-address>/<mask>	The IP prefix and length.

Mode Privileged Exec

Example To clear a prefix-list named List1:

```
awplus# clear ip prefix-list List1
```

dos

Overview Use this command to configure Denial-of-Service (DoS) protection features for a port. Six different DoS attacks can be detected: IP Options, Land, Ping-of-Death, Smurf, Synflood and Teardrop.

When the attack is detected, three different actions are available:

- Shutdown the port for one minute
- Cause an SNMP trap.
- Send traffic to the mirror port

Syntax `dos {ipoptions|land|ping-of-death|smurf broadcast <ip-address>|synflood|teardrop} action {shutdown|trap|mirror}`

Parameter	Description
dos	Denial-Of-Service.
ipoptions	IP Options attack.
land	Land attack.
ping-of-death	Large ping attack.
smurf	Ping to broadcast address.
broadcast	Broadcast.
<ip-address>	Local IP Broadcast Address.
synflood	SYN flood attack.
teardrop	IP fragmentation attack.
action	Action.
shutdown	Shutdown port.
trap	Trap to SNMP.
mirror	Send packets to mirror port.

Mode Interface Configuration for a switch port interface.

Default DoS attack detection is not configured by default on any switch port interface.

Usage notes See the below table for more information about the DoS attacks recognized by this command:

Type of DoS attack	Description
ipoptions	This type of attack occurs when an attacker sends packets containing bad IP options to a victim node. There are many different types of IP options attacks and this software does not try to distinguish between them. Rather, if this defense is activated, the number of ingress IP packets containing IP options is counted. If the number exceeds 20 packets per second, the switch considers this a possible IP options attack. This defense does not require the CPU to monitor packets, so does not put extra load on the switch's CPU.
land	This type of attack occurs when the Source IP and Destination IP address are the same. This can cause a target host to be confused. Since packets with the same source and destination addresses should never occur, these packets are dropped when this attack is enabled. This defense does not require the CPU to monitor packets, so does not put extra load on the switch's CPU.
ping-of-death	This type of attack results from a fragmented packet which, when reassembled, would exceed the maximum size of a valid IP datagram. To detect this attack, the final fragment of ICMP packets has to be sent to the CPU for inspection. This defense can therefore load the CPU. Note that the extra CPU load will not affect normal traffic switching between ports, but other protocols such as IGMP and STP may be affected. This defense is not recommended where a large number of fragmented packets are expected.
smurf	This type of attack is an ICMP ping packet to a broadcast address. Although routers should not forward packets to local broadcast addresses anymore (see RFC2644), the Smurf attack can still be explicitly discarded with this command. In order for the Smurf attack to work, the broadcast IP address is required. Any ICMP Ping packet with this destination address is considered an attack. This defense does not require the CPU to monitor packets, so does not put extra load on the switch's CPU.
synflood	In this type of attack, an attacker, seeking to overwhelm a victim with TCP connection requests, sends a large number of TCP SYN packets with bogus source addresses to the victim. The victim responds with SYN ACK packets, but since the original source addresses are bogus, the victim node does not receive any replies. If the attacker sends enough requests in a short enough

Type of DoS attack	Description
	period, the victim may freeze operations once the requests exceed the capacity of its connections queue. To defend against this form of attack, a switch port monitors the number of ingress TCP-SYN packets it receives. An attack is recorded if a port receives more 60 TCP-SYN packets per second.
teardrop	In this DoS attack, an attacker sends a packet in several fragments with a bogus offset value, used to reconstruct the packet, in one of the fragments to a victim. This results in the victim being unable to reassemble the packet, possibly causing it to freeze operations.

Examples To configure **smurf** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos smurf broadcast 192.168.1.0 action
shutdown
```

To configure **land** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos land action shutdown
```

To configure **ipoptions** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos ipoptions action shutdown
```

To configure **ping-of-death** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos ping-of-death action shutdown
```

To configure **synflood** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos synflood action shutdown
```

To configure **teardrop** DoS detection on port1.0.1, and shutdown the interface if an attack is detected, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# dos teardrop action shutdown
```

Related commands [show dos interface](#)

ip prefix-list

Overview Use this command to create an entry for an IPv4 prefix list.

Use the **no** variant of this command to delete the IPv4 prefix-list entry.

Syntax

```
ip prefix-list <list-name> [seq <1-429496725>] {deny|permit}
    {any|<ip-prefix>} [ge <0-32>] [le <0-32>]
ip prefix-list <list-name> description <text>
ip prefix-list sequence-number
no ip prefix-list <list-name> [seq <1-429496725>]
no ip prefix-list <list-name> [description <text>]
no ip prefix-list sequence-number
```

Parameter	Description
<list-name>	Specifies the name of a prefix list.
seq <1-429496725>	Sequence number of the prefix list entry.
deny	Specifies that the prefixes are excluded from the list.
permit	Specifies that the prefixes are included in the list.
<ip-prefix>	Specifies the IPv4 address and length of the network mask in dotted decimal in the format A.B.C.D/M.
any	Any prefix match. Same as 0.0.0.0/0 le 32 .
ge<0-32>	Specifies the minimum prefix length to be matched.
le<0-32>	Specifies the maximum prefix length to be matched.
<text>	Text description of the prefix list.
sequence-number	Specify sequence numbers included or excluded in prefix list.

Mode Global Configuration

Usage notes When the device processes a prefix list, it starts to match prefixes from the top of the prefix list, and stops whenever a permit or deny occurs. To promote efficiency, use the **seq** parameter and place common permits or denials towards the top of the list. If you do not use the **seq** parameter, the sequence values are generated in a sequence of 5.

The parameters **ge** and **le** specify the range of the prefix lengths to be matched. When setting these parameters, set the **le** value to be less than 32, and the **ge** value to be less than or equal to the **le** value and greater than the ip-prefix mask length.

Prefix lists implicitly exclude prefixes that are not explicitly permitted in the prefix list. This means if a prefix that is being checked against the prefix list reaches the end of the prefix list without matching a permit or deny, this prefix will be denied.

Example To deny the IP addresses between 10.0.0.0/14 (10.0.0.0 255.252.0.0) and 10.0.0.0/22 (10.0.0.0 255.255.252.0) within the 10.0.0.0/8 (10.0.0.0 255.0.0.0) addressing range, enter the following commands:

```
awplus# configure terminal
awplus(config)# ip prefix-list mylist seq 12345 deny 10.0.0.0/8
ge 14 le 22
```

Related commands

- match ip address**
- area filter-list**
- clear ip prefix-list**
- match route-type**
- show ip prefix-list**

maximum-access-list (deleted)

Overview This command has been removed from version 5.5.1-01 onwards. There is no alternative command.

show access-list (IPv4 Software ACLs)

Overview Use this command to display the specified access-list, or all access-lists if none have been specified. Note that only defined access-lists are displayed. An error message is displayed for an undefined access-list

Syntax `show access-list [<1-99>|<100-199>|<1300-1999>|<2000-2699>|<3000-3699>|<4000-4499>|<access-list-name>]`

Parameter	Description
<1-99>	IP standard access-list.
<100-199>	IP extended access-list.
<1300-1999>	IP standard access-list (standard - expanded range).
<2000-2699>	IP extended access-list (extended - expanded range).
<3000-3699>	Hardware IP access-list.
<4000-4499>	Hardware MAC access-list.
<access-list-name>	IP named access-list.

Mode User Exec and Privileged Exec

Examples To show all access-lists configured on the switch:

```
awplus# show access-list
```

```
Standard IP access list 1
  deny 172.16.2.0, wildcard bits 0.0.0.255
Standard IP access list 20
  deny 192.168.10.0, wildcard bits 0.0.0.255
  deny 192.168.12.0, wildcard bits 0.0.0.255
Hardware IP access list 3001
  permit ip 192.168.20.0 255.255.255.0 any
Hardware IP access list 3020
  permit tcp any 192.0.2.0/24
awplus#show access-list 20
```

To show the access-list with an ID of 20:

```
awplus# show access-list 20
```

```
Standard IP access-list 20
  deny 192.168.10.0, wildcard bits 0.0.0.255
  deny 192.168.12.0, wildcard bits 0.0.0.255
```

Note the following error message is displayed if you attempt to show an undefined access-list:

```
awplus# show access-list 2
```

```
% Can't find access-list 2
```

Related commands [access-list standard \(named\)](#)
[access-list \(standard numbered\)](#)
[access-list \(extended numbered\)](#)

show dos interface

Overview Use this command to display the Denial-of-Service (DoS) features configured on a switch port interface from the **dos** command. See the **dos** command for descriptions of DoS attack types.

Syntax `show dos interface {<port-list>}`

Parameter	Description
<code><port-list></code>	Specify the switch port or port list to display DoS configuration options set with the dos command.

Mode Privileged Exec

Output The following shows typical output.

Example output from the show dos interface command prior to a DoS attack

```
awplus#configure terminal
Enter configuration commands, one per line. End with CTNLT/Z.
awplus(config)#interface port1.0.1
awplus(config-if)#dos synflood action shutdown
awplus(config-if)#exit
awplus(config)#exit
awplus#show dos interface port1.0.1

DoS settings  for interface port1.0.1
-----
Port status      : Enabled
ipoptions        : Disabled
land             : Disabled
ping-of-death    : Disabled
smurf            : Disabled
synflood         : Enabled
  Action         : Shutdown port
  Attacks detected : 0
teardrop         : Disabled
awplus#
```

Example output from the show dos interface command after a synflood DoS attack

```
awplus#show dos interface port1.0.1

DoS settings for interface port1.0.1
-----
Port status      : Enabled
ipoptions        : Disabled
land             : Disabled
ping-of-death    : Disabled
smurf            : Disabled
synflood         : Enabled
  Action         : Shutdown port
  Attacks detected : 1
teardrop         : Disabled
awplus#
```

Parameters in the show dos interface command output:

Type of DoS attack	Description
Port status	Displays Enabled when the port is configured as being administratively up after issuing the no shutdown command. Displays Disabled when the port is configured as being administratively down with the shutdown command.
ipoptions	Displays Enabled when the ipoptions parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any ipoptions DoS attacks that have occurred on the interface.

Type of DoS attack	Description
	Displays Disabled when the ipoptions parameter is not configured with the dos command.
land	Displays Enabled when the land parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any land DoS attacks that have occurred on the interface. Displays Disabled when the land parameter is not configured with the dos command.
ping-of-death	Displays Enabled when the ping-of-death parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any ping-of-death DoS attacks that have occurred on the interface. Displays Disabled when the ping-of-death parameter is not configured with the dos command.
smurf	Displays Enabled when the smurf parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any smurf DoS attacks that have occurred on the interface. Displays Disabled when the smurf parameter is not configured with the dos command.
synflood	Displays Enabled when the synflood parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any synflood DoS attacks that have occurred on the interface. Displays Disabled when the synflood parameter is not configured with the dos command.
teardrop	Displays Enabled when the teardrop parameter is configured with the dos command, plus the action (Shutdown port, Mirror port, or Trap port) and the number of instances of any teardrop DoS attacks that have occurred on the interface. Displays Disabled when the teardrop parameter is not configured with the dos command.

Related dos commands

show ip access-list

Overview Use this command to display IP access-lists.

Syntax `show ip access-list [<1-99>|<100-199>|<1300-1999>|<2000-2699>|<access-list-name>]`

Parameter	Description
<1-99>	IP standard access-list.
<100-199>	IP extended access-list.
<1300-1999>	IP standard access-list (expanded range).
<2000-2699>	IP extended access-list (expanded range).
<access-list-name>	IP named access-list.

Mode User Exec and Privileged Exec

Example `awplus# show ip access-list`

Output The following shows typical output.

Example output from the show ip access-list command

```
Standard IP access-list 1
  permit 172.168.6.0, wildcard bits 0.0.0.255
  permit 192.168.6.0, wildcard bits 0.0.0.255
```


show ip prefix-list

Overview Use this command to display the IPv4 prefix-list entries.

Note that this command is valid for RIP only.

Syntax `show ip prefix-list [<name>|detail|summary]`

Parameter	Description
<name>	Specify the name of a prefix list in this placeholder.
detail	Specify this parameter to show detailed output for all IPv4 prefix lists.
summary	Specify this parameter to show summary output for all IPv4 prefix lists.

Mode User Exec and Privileged Exec

Example `awplus# show ip prefix-list`
`awplus# show ip prefix-list 10.10.0.98/8`
`awplus# show ip prefix-list detail`

Related commands [ip prefix-list](#)

vtty access-class (numbered)

Overview For IPv4, use this command to set a standard numbered software access list to be the management ACL. This is then applied to all available VTY lines for controlling remote access by Telnet and SSH. This command allows or denies packets containing the IP addresses included in the ACL to create a connection to your device.

ACLs that are attached using this command have an implicit deny-all filter as the final entry in the ACL. So a typical configuration would be to permit a specific address, or range of addresses, and rely on the deny-all filter to block all other access.

Use the **no** variant of this command to remove the access list.

Syntax vty access-class {<1-99>|<1300-1999>}
no vty access-class [<1-99>|<1300-1999>]

Parameter	Description
<1-99>	IPv4 standard access-list number
<1300-1999>	IPv4 standard access-list number (expanded range)

Mode Global Configuration

Examples To set access-list 4 to be the management ACL, use the following commands:

```
awplus# configure terminal  
awplus(config)# vty access-class 4
```

To remove access-list 4 from the management ACL, use the following commands:

```
awplus# configure terminal  
awplus(config)# no vty access-class 4
```

Output The following shows typical output.

Example output from the show running-config command

```
awplus#show running-config|grep access-class  
vty access-class 4
```

Related commands [show running-config](#)
[vty ipv6 access-class \(named\)](#)

39

IPv6 Hardware Access Control List (ACL) Commands

- Contents**
- **Introduction** on page 1936
 - **access-list hardware-deny-log** on page 1938
 - **acl-group ipv6 address** on page 1942
 - **clear access-list counters** on page 1943
 - **commit (IPv6)** on page 1944
 - **ipv6 (ipv6-host-group)** on page 1945
 - **ipv6 access-list (named IPv6 hardware ACL)** on page 1947
 - **ipv6 traffic-filter** on page 1949
 - **(named IPv6 hardware ACL: ICMP entry)** on page 1951
 - **(named IPv6 hardware ACL: IPv6 packet entry)** on page 1957
 - **(named IPv6 hardware ACL: IP protocol entry)** on page 1962
 - **(named IPv6 hardware ACL: TCP or UDP entry)** on page 1969
 - **platform acls-to-vlanclassifiers** on page 1975
 - **show access-list counters** on page 1977
 - **show acl-group ipv6 address** on page 1979
 - **show ipv6 access-list (IPv6 Hardware ACLs)** on page 1980

Introduction

Overview This chapter provides an alphabetical reference for the IPv6 Hardware Access Control List (ACL) commands, and contains detailed command information and command examples about IPv6 hardware ACLs, which are applied directly to interfaces using the **ipv6 traffic-filter** command.

For information about ACLs, see the **ACL Feature Overview and Configuration Guide**.

To apply ACLs to an LACP channel group, apply it to all the individual switch ports in the channel group. To apply ACLs to a static channel group, apply it to the static channel group itself. For more information on link aggregation see the following references:

- **Link Aggregation Feature Overview_and_Configuration_Guide**.
- **Link Aggregation Commands**

Most ACL command titles include usage information in parentheses. When the command title is completely surrounded by parentheses, the title indicates the type of ACL filter instead of keywords to enter into the CLI. For example, the title **(named IPv6 hardware ACL: IP protocol entry)** represents a command with the syntax:

```
[<sequence-number>] <action> proto <1-255> <source-addr> <dest-addr> [vlan <1-4094>]
```

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.

Sub-modes Many of the ACL commands operate from sub-modes that are specific to particular ACL types. The following table shows the CLI prompts at which ACL commands are entered.

IPv6 Hardware Access List Commands and Prompts

Command Name	Command Mode	Prompt
show acl-group ipv6 address	Privileged Exec	awplus#
show ipv6 access-list (IPv6 Hardware ACLs)	Privileged Exec	awplus#
access-list hardware-deny-log	Global Configuration	awplus(config)#
acl-group ipv6 address	Global Configuration	awplus(config)#
ipv6 access-list (named IPv6 hardware ACL)	Global Configuration	awplus(config)#
ipv6 traffic-filter	Interface Configuration	awplus(config-if)#
commit (IPv6)	IPv6 Hardware ACL Configuration	awplus(config-ipv6-hw-acl)#
(named IPv6 hardware ACL: IPv6 packet entry)	IPv6 Hardware ACL Configuration	awplus(config-ipv6-hw-acl)#
(named IPv6 hardware ACL: ICMP entry)	IPv6 Hardware ACL Configuration	awplus(config-ipv6-hw-acl)#
(named IPv6 hardware ACL: IP protocol entry)	IPv6 Hardware ACL Configuration	awplus(config-ipv6-hw-acl)#
(named IPv6 hardware ACL: TCP or UDP entry)	IPv6 Hardware ACL Configuration	awplus(config-ipv6-hw-acl)#
ipv6 (ipv6-host-group)	IPv6 ACL Host Group Configuration	awplus(config-ipv6-host-group)#

access-list hardware-deny-log

Overview Use this command to enable logging of packets that are denied by hardware IP ACLs. Hardware IP ACLs are ACLs with an ID number from 3000 to 3699. If you turn on logging, the switch will produce a log message when it drops denied packets.



CAUTION: *If you enable this logging, do not use an action of or in any of the switch's ACLs. If you do, packets that match those ACLs will also be dropped.*

Use the **no** variant of this command to disable logging of packets that are denied by hardware IP ACLs.

Syntax `access-list hardware-deny-log [info|warn] [rate <1-1000>] [burst <1-1000>] [timeout <1-3600>]`
`no access-list hardware-deny-log`

Parameter	Description
info	Give the log messages a severity level of 'info'. This is the default severity level.
warn	Give the log messages a severity level of 'warn'. If you want the messages to go to the buffered, permanent, and external log as well as the terminal, specify this parameter.
rate <1-1000>	This limits the number of log messages produced per hour. The switch will stop creating log messages if packets are denied at a higher rate than this specified rate. The default is 12 packets per hour. This means, for example, that if there are 60 denied packets in the first hour, then at most the first 12 of these packets will be logged. After that, logging will stop unless the rate drops below 12 an hour. (The actual number of packets logged depends on the number of flows the dropped packets come from; see the burst parameter).
burst <1-1000>	This is the maximum initial number of packets to log for a given flow. A flow is a set of packets with the same source IP address, destination IP address, source port, and destination port. The default is 5. The burst number reduces by 1 each time a packet in the flow is logged. Then it increases by 1 again every time the rate drops below the limit set by the rate parameter, up to the burst number.
timeout <1-3600>	This is the length of time it takes for a flow record to expire, in seconds. The switch considers that a flow has expired if it hasn't received any packets that match that flow for the timeout number of seconds. The default is 3600 seconds (1 hour). When a flow expires, its burst value is reset and logging may restart (depending on the current rate of denied packets).

Default Disabled

Mode Global Configuration

Usage notes To enable logging for a particular ACL, enter:

- this command (**access-list hardware-deny-log**)
- the command **terminal monitor**, and
- a **log** parameter at the end of the desired ACL.

The switch will send the log messages to:

- The terminal monitor, by default, as long as you enter the command **terminal monitor**, and
- If you change the severity of the messages to **warn**, to the buffered log, permanent log, and external log as well. The external log defines what logs will be sent to external syslog servers.

The log message format is:

```
DENY> IN=<interface-name> OUT=<blank> MAC=<dest-mac-addr:src-  
mac-addr:eth-type> SRC=<source-ip-address> DST=<dest-ip-address>  
LEN=<packet-length> TOS=<type-of-service> PREC=<precedence>  
TTL=<time-to-live> ID=<packet-ID> PROTO=<L4-protocol>  
SPT=<L4-source-port> DPT=<L4-dest-port> LEN=<L4-packet-length>  
MARK=<internal-packet-marking>
```

An example of a permanent log message is:

```
2023 March 03 07:04:37 local5.warning awplus ulogd[931]: DENY>  
IN=vlan100 OUT= MAC=e0:1a:ea:50:51:fc:00:00:11:11:22:22:08:00  
SRC=192.168.1.100 DST=192.170.1.1 LEN=42 TOS=00 PREC=0x00 TTL=64  
ID=0 PROTO=UDP SPT=63 DPT=63 LEN=22 MARK=0x20000000
```

Example To log packets denied by ACL 3000, which denies all Echo requests, use the commands:

```
awplus# terminal monitor  
awplus# configure terminal  
awplus(config)# access-list hardware-deny-log  
awplus(config)# access-list 3000 deny icmp any any icmp-type 8
```


Related commands (named IPv6 hardware ACL: ICMP entry)
(named IPv6 hardware ACL: IPv6 packet entry)
(named IPv6 hardware ACL: IP protocol entry)
(named IPv6 hardware ACL: TCP or UDP entry)
(named hardware ACL entry for ICMP)
(named hardware ACL entry for IP packets)
(named hardware ACL entry for IP protocols)
(named hardware ACL entry for TCP or UDP)
access-list (numbered hardware ACL for ICMP)
access-list (numbered hardware ACL for IP packets)
access-list (numbered hardware ACL for IP protocols)
access-list (numbered hardware ACL for TCP or UDP)
terminal monitor

Command changes Version 5.5.3-0.1: command added

acl-group ipv6 address

Overview Use this command to create a new named IPv6 ACL group that contains one or more IPv6 host or subnets.

This command creates a named IPv6 ACL group and enters the ACL Host Group config mode. IPv6 hosts or subnets can be added to or removed from this group. This host group can be used as a source or destination match for any hardware ACL to simplify large ACL configs with lots of IPv6 hosts.

Use the **no** variant of this command to delete an IPv6 ACL group.

Syntax `acl-group ipv6 address <group>`
`no acl-group ipv6 address <group>`

Parameter	Description
<code><group></code>	The name of the IPv6 ACL group.

Default No ACL groups exist by default.

Mode Global Configuration

Example To create an IPv6 ACL group named IPV6 _GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ipv6 address IPV6_GROUP1
awplus(config-ip-host-group)#
```

To delete an IPv6 ACL group named IPV6 _GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# no acl-group ipv6 address IPV6_GROUP1
```

Related commands [ipv6 \(ipv6-host-group\)](#)
[show acl-group ipv6 address](#)

Command changes Version 5.5.0-1.1: command added

clear access-list counters

Overview Use this command to reset the hardware access-list counters to zero. The access-list counters show the number of packets that match your hardware ACLs. Every time a hardware ACL allows or drops a packet, its counter increments.

Syntax clear access-list counters [*<acl>*]

Parameter	Description
<i><acl></i>	Clear the counters for only the specified ACL. You can enter the ACL name or number.

Mode Privileged Exec

Usage notes To view the counter values, use the command [show access-list counters](#).

Example To clear the counters for the ACL named ACL-1, use the command:
awplus# clear access-list counters ACL-1

Related commands [show access-list counters](#)

Command changes Version 5.5.2-2.1: command added

commit (IPv6)

Overview Use this command to commit the IPv6 ACL filter configuration entered at the console to the hardware immediately without exiting the IPv6 Hardware ACL Configuration mode.

This command forces the associated hardware and software IPv6 ACLs to synchronize.

Syntax `commit`

Mode IPv6 Hardware ACL Configuration

Usage notes Normally, when an IPv6 hardware ACL is edited, the new configuration state of the IPv6 ACL is not written to hardware until you exit IPv6 Hardware ACL Configuration mode. By entering this command you can ensure that the current state of a hardware access-list that is being edited is written to hardware immediately.

Scripts typically do not include the **exit** command to exit configuration modes, potentially leading to IPv6 ACL filters in hardware not being correctly updated. Using this **commit** command in a configuration script after specifying an IPv6 hardware ACL filter ensures that it is updated in the hardware.

Example To update the hardware with the IPv6 ACL filter configuration, use the command:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-ipv6-acl
awplus(config-ipv6-hw-acl)# commit
```

Related commands [ipv6 access-list \(named IPv6 hardware ACL\)](#)

ipv6 (ipv6-host-group)

Overview Use this command to add an IPv6 host or subnet to an IPv6 ACL group. Adding IPv6 hosts and subnets to an ACL group allows you to simplify ACL config when the same IP addresses are required for many ACLs.

Use the **no** variant of this command to remove an IPv6 host or subnet from an IPv6 ACL group.

Syntax `ipv6 {any|<match-ip>}`
`no ipv6 {any|<match-ip>}`

Parameter	Description						
any	Match any IP address.						
<i><match-ip></i>	The addresses to match against. You can specify a single host or a subnet. The following are the valid formats for specifying the addresses: <table><tr><td><i><ipv6-addr></i></td><td>Specifies a single host address. The IPv6 address uses the format X:X::X:X.</td></tr><tr><td><i><ipv6-addr>/<prefix></i></td><td>Specifies an address and prefix length. The IPv6 address prefix uses the format X:X::/ prefix-length. The prefix-length is usually set between 0 and 64, or has the value 128.</td></tr><tr><td><i><ipv6-addr> <reverse-mask></i></td><td>An IPv6 host and a reverse mask in format X:X::X:X.</td></tr></table>	<i><ipv6-addr></i>	Specifies a single host address. The IPv6 address uses the format X:X::X:X.	<i><ipv6-addr>/<prefix></i>	Specifies an address and prefix length. The IPv6 address prefix uses the format X:X::/ prefix-length. The prefix-length is usually set between 0 and 64, or has the value 128.	<i><ipv6-addr> <reverse-mask></i>	An IPv6 host and a reverse mask in format X:X::X:X.
<i><ipv6-addr></i>	Specifies a single host address. The IPv6 address uses the format X:X::X:X.						
<i><ipv6-addr>/<prefix></i>	Specifies an address and prefix length. The IPv6 address prefix uses the format X:X::/ prefix-length. The prefix-length is usually set between 0 and 64, or has the value 128.						
<i><ipv6-addr> <reverse-mask></i>	An IPv6 host and a reverse mask in format X:X::X:X.						

Default No hosts or subnets are in an IPv6 ACL group by default.

Mode IPv6 ACL Host Group Configuration

Example To add the subnet 2001:DB8::/32 to an IPv6 ACL group IPV6_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ipv6 address IPV6_GROUP1
awplus(config-ipv6-host-group)# ipv6 2001:DB8::/32
```

To remove the subnet 2001:DB8::/32 from an IPv6 ACL group IPV6_GROUP1, use the commands:

```
awplus# configure terminal
awplus(config)# acl-group ipv6 address IPV6_GROUP1
awplus(config-ipv6-host-group)# no ipv6 2001:DB8::/32
```

Related commands **acl-group ipv6 address**
show acl-group ipv6 address

Command changes Version 5.5.0-1.1: command added

ipv6 access-list (named IPv6 hardware ACL)

Overview Use this command to either create a new IPv6 hardware access-list, or to select an existing IPv6 hardware access-list in order to apply a filter entry to it.

Use the **no** variant of this command to delete an existing IPv6 hardware access-list.

NOTE: Before you can delete an access-list, you must first remove it from any interface it is assigned to.

Syntax `ipv6 access-list <ipv6-access-list-name>`
`no ipv6 access-list <ipv6-access-list-name>`

Parameter	Description
<code><ipv6-access-list-name></code>	Specify an IPv6 access-list name.

Mode Global Configuration

Default Any traffic on an interface controlled by a hardware ACL that does not explicitly match a filter is permitted.

Usage notes Use IPv6 hardware named access-lists to control the transmission of IPv6 packets on an interface, and restrict the content of routing updates. The switch stops checking the IPv6 hardware named access-list when a match is encountered.

This command moves you to the (config-ipv6-hw-acl) prompt for the selected IPv6 hardware named access-list number. From there you can configure the filters for this selected IPv6 hardware named access-list.

Once you have configured the ACL, use the **ipv6 traffic-filter** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.

Examples To create an IPv6 access-list named "my-ipv6-acl", use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-ipv6-acl
awplus(config-ipv6-hw-acl)#
```

To delete the IPv6 access-list named "my-ipv6-acl", use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 access-list my-ipv6-acl
```

Related commands **(named IPv6 hardware ACL: ICMP entry)**
(named IPv6 hardware ACL: IPv6 packet entry)
(named IPv6 hardware ACL: IP protocol entry)
(named IPv6 hardware ACL: TCP or UDP entry)
ipv6 traffic-filter
match access-group
show ipv6 access-list (IPv6 Hardware ACLs)

ipv6 traffic-filter

Overview This command adds an IPv6 hardware-based access-list to an interface. The number of access-lists that can be added is determined by the amount of available space in the hardware-based packet classification tables.

Use the **no** variant of this command to remove an IPv6 hardware-based access-list from an interface.

You can apply or remove an IPv6 hardware access-list from all ports or selected ports as required.

Syntax `ipv6 traffic-filter <ipv6-access-list-name>`
`no ipv6 traffic-filter <ipv6-access-list-name>`

Parameter	Description
<code><ipv6-access-list-name></code>	Hardware IPv6 access-list name.

Mode Interface Configuration (to apply an IPv6 hardware ACL to a specific switch port).

Alternatively, Global Configuration (to apply an IPv6 hardware ACL to all of the switch ports).

Usage notes This command adds an IPv6 hardware-based access-list to an interface. The number of access-lists that can be added is determined by the amount of available space in the hardware-based packet classification tables.

To apply the access-list to all ports on the switch, execute the command in the Global Configuration mode. To apply the access-list to a Layer 2 interface or Layer 2 interface range, apply the command in the Interface Configuration mode. See the examples for each mode below.

Examples To add access-list "acl1" as a traffic-filter to all ports on the switch, enter the commands:

```
awplus# configure terminal
awplus(config)# ipv6 traffic-filter acl1
```

To remove access-list "acl1" as a traffic-filter from all ports on the switch, enter the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 traffic-filter acl1
```

To add access-list "acl1" as a traffic-filter to interface port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# ipv6 traffic-filter acl1
```

To remove access-list "acl1" as a traffic-filter from interface port1.0.1, enter the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no ipv6 traffic-filter acl1
```

Related commands [ipv6 access-list \(named IPv6 hardware ACL\)](#)
[\(named IPv6 hardware ACL: ICMP entry\)](#)
[\(named IPv6 hardware ACL: IPv6 packet entry\)](#)
[\(named IPv6 hardware ACL: IP protocol entry\)](#)
[\(named IPv6 hardware ACL: TCP or UDP entry\)](#)
[show ipv6 access-list \(IPv6 Hardware ACLs\)](#)

(named IPv6 hardware ACL: ICMP entry)

Overview Use this command to add a new ICMP filter entry to the current IPv6 hardware access-list. The filter will match on any ICMP packet that has the specified IPv6 source and destination IP addresses and (optionally) ICMP type. You can specify the value **any** if source or destination address does not matter.

The **no** variant of this command removes a filter entry from the current IPv6 hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny icmp 2001::0db8::0/64 any**).

You can find the sequence number by running the **show ipv6 access-list (IPv6 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* icmp *<source-addr>* *<dest-addr>*
[icmp-type *<number>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* icmp *<source-addr>* *<dest-addr>* [icmp-type *<number>*]
[vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description				
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535.				
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.				
icmp	Match against ICMP packets.				
<i><source-addr></i>	The source addresses to match against. You can specify a single host, a range, or all source addresses. The following are the valid formats for specifying the source: <table border="1"> <tr> <td>any</td><td>Match any source host.</td></tr> <tr> <td><i><ipv6-src-address/prefix-length></i></td><td>Match the specified source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.</td></tr> </table>	any	Match any source host.	<i><ipv6-src-address/prefix-length></i>	Match the specified source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
any	Match any source host.				
<i><ipv6-src-address/prefix-length></i>	Match the specified source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.				

Parameter	Description
	<i><ipv6-src-address></i> <i><ipv6-src-wildcard></i> Match the specified IPv6 source address, masked using wildcard bits. The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
	host <i><ipv6-source-host></i> Match a single source host address. The IPv6 address uses the format X:X::X:X.
<i><dest-addr></i>	The destination addresses to match against. You can specify a single host, a range, or all destination addresses. The following are the valid formats for specifying the destination:
	any Match any destination host.
	<i><ipv6-dest-address/prefix-length></i> Match the specified destination address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
	<i><ipv6-dest-address></i> <i><ipv6-dest-wildcard></i> Match the specified destination address, masked using wildcard bits. The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
	host <i><ipv6-dest-host></i> Match a single destination host address. The IPv6 address uses the format X:X::X:X.
icmp-type <i><number></i>	The type of ICMP message to match against, as defined in RFC792 and RFC950. Values include:
	0 Echo replies.
	3 Destination unreachable messages.

Parameter	Description
	4 Source quench messages.
	5 Redirect (change route) messages.
	8 Echo requests.
	11 Time exceeded messages.
	12 Parameter problem messages.
	13 Timestamp requests.
	14 Timestamp replies.
	15 Information requests.
	16 Information replies.
	17 Address mask requests.
	18 Address mask replies.
<code>vlan <1-4094></code>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
<code>log</code>	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv6 Hardware ACL Configuration (accessed by running the command **ipv6 access-list (named IPv6 hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **ipv6 access-list (named IPv6 hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ipv6-hw-acl)#
```

Then use this command (and the other “named IPv6 hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL.

If you specify a sequence number, the new entry is inserted at the specified location. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Once you have configured the ACL, use the **ipv6 traffic-filter** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the ACL named “my-acl”, to block ICMP packets sent from network 2001:0db8::0/64 , use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# deny icmp 2001:0db8::0/64 any
```

To remove a filter entry from the ACL named “my-acl” that blocks all ICMP packets sent from network 2001:0db8::0/ 64 , use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# no deny icmp 2001:0db8::0/64 any
```

To specify an ACL named “my-acl1” and add a filter entry that blocks all ICMP6 echo requests, enter the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl1
awplus(config-ipv6-hw-acl)# deny icmp any any icmp-type 128
```

To specify an ACL named “my-acl2” and add a filter entry that blocks all ICMP6 echo requests on the default VLAN (vlan1), enter the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl2
awplus(config-ipv6-hw-acl)# deny icmp any any icmp-type 128 vlan
1
```

To remove a filter entry that blocks all ICMP6 echo requests from the ACL named “my-acl1”, enter the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl1
awplus(config-ipv6-hw-acl)# no deny icmp any any icmp-type 128
```

Related commands **access-list hardware-deny-log**
ipv6 access-list (named IPv6 hardware ACL)
ipv6 traffic-filter
match access-group
show ipv6 access-list (IPv6 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named IPv6 hardware ACL: IPv6 packet entry)

Overview Use this command to add an IPv6 packet filter entry to the current hardware access-list. The filter will match on IPv6 packets that have the specified source and destination IPv6 address and (optionally) prefix. You can use the value **any** instead of source or destination IPv6 address if an address does not matter.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny ipv6 2001:0db8::0/64 any**).

You can find the sequence number by running the **show ipv6 access-list (IPv6 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* ipv6 *<source-addr>* *<dest-addr>*
[vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* ipv6 *<source-addr>* *<dest-addr>* [vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
ipv6	Match against IPv6 packets
<i><source-addr></i>	The source addresses to match against. You can specify a single host, a range, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source host.
	<i><ipv6-src-address/prefix-length></i> Match the specified source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
	<i><ipv6-src-address></i> <i><ipv6-src-wildcard></i> Match the specified IPv6 source address, masked using wildcard bits.

Parameter	Description
	The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
host <ipv6-source-host>	Match a single source host address. The IPv6 address uses the format X:X::X:X.
<dest-addr>	The destination addresses to match against. You can specify a single host, a range, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination host.
<ipv6-dest-address/prefix-length>	Match the specified destination address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<ipv6-dest-address> <ipv6-dest-wildcard>	Match the specified destination address, masked using wildcard bits. The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
host <ipv6-dest-host>	Match a single destination host address. The IPv6 address uses the format X:X::X:X.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv6 Hardware ACL Configuration (accessed by running the command **ipv6 access-list (named IPv6 hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **ipv6 access-list (named IPv6 hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ipv6-hw-acl)#
```

Then use this command (and the other “named IPv6 hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL.

If you specify a sequence number, the new entry is inserted at the specified location. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Once you have configured the ACL, use the **ipv6 traffic-filter** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the ACL named “my-acl” to block IPv6 traffic sent from network 2001:0db8::0/64, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# deny ipv6 2001:0db8::0/64 any
```

To remove a filter entry from the ACL named “my-acl” that blocks all IPv6 traffic sent from network 2001:0db8::0/ 64, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# no deny ipv6 2001:0db8::0/64 any
```

Related commands **access-list hardware-deny-log**
ipv6 access-list (named IPv6 hardware ACL)
ipv6 traffic-filter
match access-group
show ipv6 access-list (IPv6 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named IPv6 hardware ACL: IP protocol entry)

Overview Use this command to add an IP protocol type filter entry to the current IPv6 hardware access-list. The filter will match on IPv6 packets that have the specified IP protocol number, and the specified IPv6 addresses. You can use the value **any** instead of source or destination IPv6 address if an address does not matter.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny proto 2 2001:0db8::0/64 any**).

You can find the sequence number by running the **show ipv6 access-list (IPv6 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* proto *<1-255>* *<source-addr>* *<dest-addr>* [*<vlan 1-4094>*] [*log*]
no *<sequence-number>*
no *<action>* proto *<1-255>* *<source-addr>* *<dest-addr>* [*<vlan 1-4094>*] [*log*]

The following actions are available for hardware ACLs:

Values for the <action> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <vid> port <port-number>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameters in IP protocol ACL entries

Parameter	Description				
<code><sequence-number></code>	The sequence number for the filter entry of the selected access control list, in the range 1-65535.				
<code><action></code>	The action that the switch will take on matching packets. See the table above for valid values.				
<code>proto <1-255></code>	The IP protocol number to match against, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.				
<code><source-addr></code>	The source addresses to match against. You can specify a single host, a range, or all source addresses. The following are the valid formats for specifying the source: <table border="1"> <tbody> <tr> <td><code>any</code></td><td>Match any source host.</td></tr> <tr> <td><code><ipv6-src-address/prefix-length></code></td><td>Match the specified source address and prefix length.</td></tr> </tbody> </table>	<code>any</code>	Match any source host.	<code><ipv6-src-address/prefix-length></code>	Match the specified source address and prefix length.
<code>any</code>	Match any source host.				
<code><ipv6-src-address/prefix-length></code>	Match the specified source address and prefix length.				

Parameter	Description
	The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<ipv6-src-address> <ipv6-src-wildcard>	Match the specified IPv6 source address, masked using wildcard bits. The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
host <ipv6-source-host>	Match a single source host address. The IPv6 address uses the format X:X::X:X.
<dest-addr>	The destination addresses to match against. You can specify a single host, a range, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination host.
<ipv6-dest-address/ prefix-length>	Match the specified destination address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<ipv6-dest-address> <ipv6-dest-wildcard>	Match the specified destination address, masked using wildcard bits. The IPv6 address uses the format X:X::X:X. In the wildcard bits, 1 represents bits to ignore, and 0 represents bits to match.
host <ipv6-dest-host>	Match a single destination host address. The IPv6 address uses the format X:X::X:X.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.

Parameter	Description
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)
89	OSPFv2 [RFC1583]

Protocol Number	Protocol Description [RFC]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode IPv6 Hardware ACL Configuration (accessed by running the command **ipv6 access-list (named IPv6 hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **ipv6 access-list (named IPv6 hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ipv6-hw-acl)#
```

Then use this command (and the other “named IPv6 hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL.

If you specify a sequence number, the new entry is inserted at the specified location. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Once you have configured the ACL, use the **ipv6 traffic-filter** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry to the ACL named “my-acl” to deny IGMP packets from 2001:0db8::0/64 , use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# deny proto 2 2001:0db8::0/64 any
```

To remove a filter entry that blocks IGMP packets from network 2001:0db8::0/64 from the ACL named “my-acl”, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# no deny proto 2 2001:0db8::0/64 any
```

Related commands [access-list hardware-deny-log](#)
[ipv6 access-list \(named IPv6 hardware ACL\)](#)
[ipv6 traffic-filter](#)
[match access-group](#)
[show ipv6 access-list \(IPv6 Hardware ACLs\)](#)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

(named IPv6 hardware ACL: TCP or UDP entry)

Overview Use this command to add a TCP or UDP filter entry to the current IPv6 hardware access-list. The access-list will match on TCP or UDP packets that have the specified source and destination IP addresses and optionally, port values. You can use the value **any** instead of source or destination IP address if an address does not matter.

The **no** variant of this command removes a filter entry from the current hardware access-list. You can specify the filter entry for removal by entering either its sequence number (e.g. **no 100**), or by entering its filter profile without specifying its sequence number (e.g. **no deny tcp 2001:0db8::0/64 any**).

You can find the sequence number by running the **show ipv6 access-list (IPv6 Hardware ACLs)** command.

Hardware ACLs will **permit** access unless **explicitly denied** by an ACL action.



CAUTION: Specifying a “send” action enables you to use ACLs to redirect packets from their original destination. Use such ACLs with caution. They could prevent control packets from reaching the correct destination, such as EPSR healthcheck messages and AMF messages.

Syntax [*<sequence-number>*] *<action>* {tcp|udp} *<source-addr>* [*<source-ports>*] *<dest-addr>* [*<dest-ports>*] [vlan *<1-4094>*] [log]
no *<sequence-number>*
no *<action>* {tcp|udp} *<source-addr>* [*<source-ports>*] *<dest-addr>* [*<dest-ports>*] [vlan *<1-4094>*] [log]

The following actions are available for hardware ACLs:

Values for the <i><action></i> parameter	
deny	Reject packets that match the source and destination filtering specified with this command.
permit	Permit packets that match the source and destination filtering specified with this command.
copy-to-cpu	Send a copy of matching packets to the CPU.
copy-to-mirror [interface <i>port-number</i>]	Send a copy of matching packets to a mirror port. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.
send-to-vlan-port vlan <i><vid></i> port <i><port-number></i>	Send matching packets to the specified port, tagged with the specified VLAN. The specified port must belong to the specified VLAN.
send-to-cpu	Send matching packets to the CPU.

Parameter	Description
<i><sequence-number></i>	The sequence number for the filter entry of the selected access control list, in the range 1-65535. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.
<i><action></i>	The action that the switch will take on matching packets. See the table above for valid values.
tcp	Match against TCP packets.
udp	Match against UDP packets.
<i><source-addr></i>	The source addresses to match against. You can specify a single host, a subnet, or all source addresses. The following are the valid formats for specifying the source:
	any Match any source IP address.
	host <i><ip-addr></i> Match a single source host with the IP address given by <i><ip-addr></i> in dotted decimal notation.

Parameter	Description
<i><ip-addr>/ <prefix></i>	Match any source IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.
<i><ip-addr> <reverse-mask></i>	Match any source IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><source-ports></i>	Match source TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <i><0-65535></i>	Match a single port number.
lt <i><0-65535></i>	Match all port numbers that are less than the specified port number.
gt <i><0-65535></i>	Match all port numbers that are greater than the specified port number.
ne <i><0-65535></i>	Match all port numbers except the specified port number.
range <i><start-port> <end-port></i>	Match a range of port numbers.
<i><dest-addr></i>	The destination addresses to match against. You can specify a single host, a subnet, or all destination addresses. The following are the valid formats for specifying the destination:
any	Match any destination IP address.
host <i><ip-addr></i>	Match a single destination host with the IP address given by <i><ip-addr></i> in dotted decimal notation.
<i><ip-addr>/ <prefix></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering the IPv4 address, then a forward slash, then the prefix length.

Parameter	Description
<i><ip-addr> <reverse-mask></i>	Match any destination IP address within the specified subnet. Specify the subnet by entering a reverse mask in dotted decimal format. For example, entering "192.168.1.1 0.0.0.255" is the same as entering 192.168.1.1/24.
<i><dest-ports></i>	Match destination TCP or UDP port numbers. Port numbers are specified as integers between 0 and 65535. You can specify one or more port numbers as follows:
eq <0-65535>	Match a single port number.
lt <0-65535>	Match all port numbers that are less than the specified port number.
gt <0-65535>	Match all port numbers that are greater than the specified port number.
ne <0-65535>	Match all port numbers except the specified port number.
range <start-port> <end-port>	Match a range of port numbers.
vlan <1-4094>	The VLAN to match against. The ACL will match against the specified ID in the packet's VLAN tag.
log	Log packets that are denied by this ACL. You must also enable the logging, using the command access-list hardware-deny-log .

Mode IPv6 Hardware ACL Configuration (accessed by running the command **ipv6 access-list (named IPv6 hardware ACL)**)

Default On an interface controlled by a hardware ACL, any traffic that does not explicitly match a filter is permitted.

Usage notes To use this command, first run the command **ipv6 access-list (named IPv6 hardware ACL)** and enter the desired access-list name. This changes the prompt to:

```
awplus(config-ipv6-hw-acl)#
```

Then use this command (and the other “named IPv6 hardware ACL: entry” commands) to add filter entries. You can add multiple filter entries to an ACL.

If you specify a sequence number, the new entry is inserted at the specified location. If you do not specify a sequence number, the switch puts the entry at the end of the ACL and assigns it the next available multiple of 4 as its sequence number.

Once you have configured the ACL, use the **ipv6 traffic-filter** or the **match access-group** command to apply this ACL to a port, VLAN or QoS class-map. Note that the ACL will only apply to incoming data packets.

Examples To add a filter entry that blocks all SSH traffic from network 2001:0db8::0/64 to the hardware IPv6 access-list named “my-acl”, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# deny tcp 2001:0db8::0/64 any eq 22
```

To add a filter entry that blocks all SSH traffic from network 2001:0db8::0/64 on the default VLAN (vlan1) to the hardware IPv6 access-list named “my-acl”, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# deny tcp 2001:0db8::0/64 any eq 22
vlan 1
```

To remove an ACL filter entry that blocks all SSH traffic from network 2001:0db8::0/ 64 from the hardware IPv6 access-list named “my-acl”, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list my-acl
awplus(config-ipv6-hw-acl)# no deny tcp 2001:0db8::0/64 any eq
22
```

Related commands **access-list hardware-deny-log**
ipv6 access-list (named IPv6 hardware ACL)
ipv6 traffic-filter
match access-group
show ipv6 access-list (IPv6 Hardware ACLs)

Command changes Version 5.5.3-0.1: **deny-and-not-cpu** action parameter added on x230, x550, x930, x950, SBx908 GEN2 Series switches

Version 5.5.3-0.1: **log** parameter added on x220, x320, x530, x550, x950, SBx908 GEN2 Series switches

Version 5.4.7-2.1: **send-to-vlan-port** action parameter added on GS900MX, GS980MX, XS900MX, SBx8100, SBx908 GEN2, x950 Series switches

Version 5.4.6-2.1: **send-to-vlan-port** action parameter added on IX5, x230, x310, x510, x930 Series switches

platform acls-to-vlanclassifiers

Overview Use this command to configure the amount of memory allocated (or split) between ACLs and VLAN classifiers.

Use the **no** variant of this command to reset the allocation to the default setting.

Syntax platform acls-to-vlanclassifiers {more-vlan-classifiers | half-and-half | more-acls}
no platform acls-to-vlanclassifiers

Parameter	Description
more-vlan-classifiers	Support more dynamic VLAN classifiers.
half-and-half	Support the same number of ACLs and VLAN classifiers.
more-acls	Support more ACLs.

Default More dynamic VLAN classifiers

Mode Global Configuration

Usage notes Access-lists and VLAN classifiers use the same memory/table in hardware. This command is used to split this memory to support more ACLs, more VLAN classifiers or the same number of ACLs and VLAN classifiers.

Note: For this command to take effect, you must copy it to the startup configuration using the **copy running-config startup-config** command and then reboot the switch.

Example To store more dynamic VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-vlan-
classifiers
```

To store the same number of ACLs and VLAN classifiers, use the commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers half-and-half
```

To store more ACLs, use the following commands:

```
awplus# configure terminal
awplus(config)# platform acls-to-vlanclassifiers more-acls
```

To reset the allocation to the default settings, use the commands:

```
awplus# configure terminal
awplus(config)# no platform acls-to-vlanclassifiers
```

Related commands

- show platform**
- show platform classifier statistics utilization brief**
- show running-config**
- show startup-config**

Command changes

- Version 5.4.9-0.1: command added
- Version 5.5.0-0.1: **tunnel-support** parameter added for x530 series

show access-list counters

Overview Use this command to show the number of packets that match one or all of your hardware ACLs. Every time a hardware ACL allows or drops a packet, its counter increments. This lets you check your ACL configuration.

Syntax show access-list counters [<acl>]

Parameter	Description
<acl>	Display the number of packets that match only the specified ACL. You can enter the ACL name or number.

Mode User Exec and Privileged Exec

Usage notes This command displays the counter values since the last time they were cleared. To clear the counter values, enter the command **clear access-list counters**.

To accurately measure the number of packet hits per ACL, you need to read the counters for all ACLs frequently.

Example To show the number of packets that match all hardware ACLs, use the following command:

```
awplus# show access-list counters
```

Output The following shows typical output.

Example output from show access-list counters

```
awplus#show access-list counters
Hardware ACL Packet Counters

ACL-1
Packet Hits: 17
ACL-2
Packet Hits: 0
ACL-3
Packet Hits: 1
```

Output The following shows typical output.

Example output from show access-list counters ACL-1

```
awplus#show access-list counters ACL-1
Hardware ACL Packet Counters

ACL-1
Packet Hits: 17
```

Parameters in the output from show access-list counters

Parameter	Description
Packet Hits	The number of packets that match the ACL. The count includes both dropped and allowed packets.

Related commands [clear access-list counters](#)
[show access-group](#)
[show interface access-group](#)

Command changes Version 5.5.2-2.1: reading the counters no longer clears them
Version 5.5.1-2.1: command added

show acl-group ipv6 address

Overview Use this command to show the hosts and subnets in a named IPv6 ACL group.

Syntax show acl-group ipv6 address <group>

Parameter	Description
<group>	The name of the IPv6 ACL group.

Mode Privileged Exec

Example To show all hosts and subnets in an IPv6 ACL group IPV6_GROUP1, use the command:

```
awplus# show acl-group ipv6 address IPV6_GROUP1
```

Output The following shows typical output.

Example output from show acl-group ipv6 address IPV6_GROUP1

```
awplus#show acl-group ipv6 address IPV6_GROUP1
Host Group: IPV6_GROUP1

2001:DB8::/32
2001:DB9::1/128
```

Related commands [acl-group ipv6 address](#)
[ipv6 \(ipv6-host-group\)](#)

Command changes Version 5.5.0-1.1: command added

show ipv6 access-list (IPv6 Hardware ACLs)

Overview Use this command to display all configured hardware IPv6 access-lists or the IPv6 access-list specified by name. Omitting the optional name parameter will display all IPv6 ACLs.

Syntax show ipv6 access-list [<name>]

Parameter	Description
<name>	Hardware IPv6 access-list name.

Mode User Exec and Privileged Exec

Example To show all configured IPv6 access-lists use the command:

```
awplus# show ipv6 access-list
```

Output The following shows typical output.

Example output from the show ipv6 access-list command

```
IPv6 access-list deny_ssh
deny tcp abcd::0/64 any eq 22
```

ACLs that are added dynamically during port authentication will be displayed with the label 'dynamic':

```
awplus# show ipv6 access-list
```

```
Named Standard IPv6 access list red
 10 deny any

Named Extended IPv6 access list blue
 10 deny ip any any

Hardware IPv6 access list dacl-port1.0.45-2477.03fe.ded4-ipv6 (dynamic)
 4 deny ipv6 any any
```

Related commands

- [ipv6 access-list \(named IPv6 hardware ACL\)](#)
- [\(named IPv6 hardware ACL: ICMP entry\)](#)
- [\(named IPv6 hardware ACL: IPv6 packet entry\)](#)
- [\(named IPv6 hardware ACL: IP protocol entry\)](#)
- [\(named IPv6 hardware ACL: TCP or UDP entry\)](#)
- [ipv6 traffic-filter](#)

40

IPv6 Software Access Control List (ACL) Commands

- Contents**
- **Introduction** on page 1982
 - **ipv6 access-list extended (named)** on page 1984
 - **ipv6 access-list extended proto** on page 1989
 - **(ipv6 access-list extended IP protocol filter)** on page 1994
 - **(ipv6 access-list extended TCP UDP filter)** on page 1999
 - **ipv6 access-list standard (named)** on page 2002
 - **(ipv6 access-list standard filter)** on page 2004
 - **ipv6 prefix-list** on page 2006
 - **show ipv6 access-list (IPv6 Software ACLs)** on page 2008
 - **show ipv6 prefix-list** on page 2010
 - **vty ipv6 access-class (named)** on page 2011

Introduction

Overview This chapter provides an alphabetical reference for the IPv6 Software Access Control List (ACL) commands, and contains detailed command information and command examples about IPv6 software ACLs as applied to Routing and Multicasting, which are not applied to interfaces.

For information about ACLs, see the [ACL Feature Overview and Configuration Guide](#).

To apply ACLs to an LACP channel group, apply it to all the individual switch ports in the channel group. To apply ACLs to a static channel group, apply it to the static channel group itself. For more information on link aggregation see the following references:

- [Link Aggregation Feature Overview_and_Configuration_Guide](#).
- [Link Aggregation Commands](#)

Note that text in parenthesis in command names indicates usage not keyword entry. For example, **ipv6-access-list (named)** indicates named IPv6 ACLs entered as:

```
ipv6-access-list<name>
```

where <name> is a placeholder not a keyword.

Note also that parenthesis surrounding ACL filters indicates the type of ACL filter not the keyword entry in the CLI. For example, **(ipv6 access-list standard IPv6 filter)** represents command entry in the format shown in the syntax:

```
[<sequence-number>] {deny|permit} {<source-ipv6-address/prefix-length>|any}
```

NOTE: *Software ACLs will access unless by an ACL action.*

Sub-modes Many of the ACL commands operate from sub-modes that are specific to particular ACL types. The following table shows the CLI prompts at which ACL commands are entered.

IPv6 Software Access List Commands and Prompts

Command Name	Command Mode	Prompt
show ipv6 access-list (IPv6 Software ACLs)	Privileged Exec	awplus#
ipv6 access-list extended (named)	Global Configuration	awplus(config)#
ipv6 access-list standard (named)	Global Configuration	awplus(config)#
(ipv6 access-list extended IP protocol filter)	IPv6 Extended ACL Configuration	awplus(config-ipv6-ext-acl)#
(ipv6 access-list extended TCP UDP filter)	IPv6 Extended ACL Configuration	awplus(config-ipv6-ext-acl)#
(ipv6 access-list standard filter)	IPv6 Standard ACL Configuration	awplus(config-ipv6-std-acl)#

ipv6 access-list extended (named)

Overview Use this command when configuring an IPv6 extended access-list for filtering frames that permit or deny IP, ICMP, TCP, UDP packets or ICMP packets with a specific value based on the source or destination.

The **no** variant of this command removes a specified IPv6 extended access-list.

Syntax [list-name] `ipv6 access-list extended <list-name>`
`no ipv6 access-list extended <list-name>`

Parameter	Description
<code><list-name></code>	A user-defined name for the IPv6 software extended access- list.

Syntax [any|icmp|ip] `ipv6 access-list extended <list-name> {deny|permit} {any|icmp|ip} {<ipv6-source-address/prefix-length>|any} {<ipv6-destination-address/prefix-length>|any} [<icmp-type <icmp-type>] [log]`
`no ipv6 access-list extended <list-name> {deny|permit} {any|icmp|ip} {<ipv6-source-address/prefix-length>|any} {<ipv6-destination-address/prefix-length>|any} [<icmp-type <icmp-type>] [log]`

Syntax [tcp|udp] `ipv6 access-list extended <list-name> {deny|permit} {tcp|udp} {<ipv6-source-address/prefix-length>|any} {eq <sourceport>|lt <sourceport>|gt <sourceport>|ne <sourceport>}{<ipv6-destination-address/prefix-length>|any} {eq <destport>|lt <destport>|gt <destport>|ne <destport>} [log]`

`no ipv6 access-list extended <list-name> {deny|permit} {tcp|udp} {<ipv6-source-address/prefix-length>|any} {eq <sourceport>|lt <sourceport>|gt <sourceport>|ne <sourceport>}{<ipv6-destination-addr/prefix-length>|any} {eq <destport>|lt <destport>|gt <destport>|ne <destport>} [log]`

Parameter	Description
<list-name>	A user-defined name for the IPv6 software extended access-list.
deny	The IPv6 software extended access-list rejects packets that match the type, source, and destination filtering specified with this command.
permit	The IPv6 software extended access-list permits packets that match the type, source, and destination filtering specified with this command.
any	For ICMP/IP The IPv6 software extended access-list matches any type of packet.
ip	For ICMP/IP The IPv6 software extended access-list matches only IP packets.
icmp	For ICMP/IP The IPv6 software extended access-list matches only ICMP packets.
tcp	For TCP/UDP The IPv6 software extended access-list matches only TCP packets.
udp	For TCP/UDP The IPv6 software extended access-list matches only UDP packets.
<ipv6-source-address/prefix-length>	Specifies a source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<ipv6-destination-address/prefix-length>	Specifies a destination address and prefix length.

Parameter	Description						
	The IPv6 address uses the format X:X::X:X/ Prefix-Length. The prefix-length is usually set between 0 and 64.						
any	Matches any IPv6 address.						
<sourceport>	For TCP/UDP The source port number, specified as an integer between 0 and 65535.						
<destport>	For TCP/UDP The destination port number, specified as an integer between 0 and 65535.						
icmp-type	For ICMP IP Matches only a specified type of ICMP messages. This is valid only when the filtering is set to match ICMP pack ets.						
eq	For TCP/UDP Matches port numbers equal to the port number speci fied immediately after this parameter.						
lt	For TCP/UDP Matches port numbers less than the port number spec ified immediately after this parameter.						
gt	For TCP/UDP Matches port numbers greater than the port number specified immediately after this parameter.						
ne	For TCP/UDP Matches port numbers not equal to the port number specified immediately after this parameter.						
<icmp-type>	For ICMP IP The ICMP type, as defined in RFC792 and RFC950. Spec ify one of the following integers to create a filter for the ICMP message type: <table border="1"> <tr> <td>0</td><td>Echo replies.</td></tr> <tr> <td>3</td><td>Destination unreachable mes- sages.</td></tr> <tr> <td>4</td><td>Source quench messages.</td></tr> </table>	0	Echo replies.	3	Destination unreachable mes- sages.	4	Source quench messages.
0	Echo replies.						
3	Destination unreachable mes- sages.						
4	Source quench messages.						

Parameter	Description
	5 Redirect (change route) messages.
	8 Echo requests.
	11 Time exceeded messages.
	12 Parameter problem messages.
	13 Timestamp requests.
	14 Timestamp replies.
	15 Information requests.
	16 Information replies.
	17 Address mask requests.
	18 Address mask replies.
log	Logs the results.

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use IPv6 extended access-lists to control the transmission of IPv6 packets on an interface, and restrict the content of routing updates. The switch stops checking the IPv6 extended access-list when a match is encountered.

For backwards compatibility you can either create IPv6 extended access-lists from within this command, or you can enter `ipv6 access-list extended` followed by only the IPv6 extended access-list name. This latter (and preferred) method moves you to the `(config-ipv6-ext-acl)` prompt for the selected IPv6 extended access-list number, and from here you can configure the filters for this selected access-list.

NOTE: *Software ACLs will access unless by an ACL action.*

Example 1 To add a new filter to the access-list named my - list that will reject incoming ICMP packets from 2001:0db8::0/64 to 2001:0db8::f/64, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# icmp 2001:0db8::0/64
2001:0db8::f/64
```

Example 2 To insert a new filter at sequence number 5 of the access-list named my - list that will accept ICMP type 8 packets from the 2001:0db8::0/64 network to the 2001:0db8::f/64 network, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# 5 icmp 2001:0db8::0/64
2001:0db8::f/64
```

Example 3 To create the access-list named TK to deny TCP protocols, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended TK deny tcp any eq 14
any lt 12 log
```

Related commands [ipv6 access-list extended proto](#)
[\(ipv6 access-list extended IP protocol filter\)](#)
[\(ipv6 access-list extended TCP UDP filter\)](#)
[show ipv6 access-list \(IPv6 Software ACLs\)](#)
[show running-config](#)

Command changes Version 5.5.1-0.1: Support for the **no** variant added

ipv6 access-list extended proto

Overview Use this command when configuring an IPv6 extended access-list for filtering frames that permit or deny packets with a specific value based on the IP protocol number specified.

The **no** variant of this command removes a specified IPv6 extended access-list with an IP protocol number.

Syntax `ipv6 access-list extended <list-name> {deny|permit} proto
<ip-protocol> {<ipv6-source-address/prefix>|any} {<ipv6-destination-address/prefix>|any} [log]`
`no ipv6 access-list extended <list-name> {deny|permit} proto
<ip-protocol>{<ipv6-source-address/prefix>|any} {<ipv6-destination-address/prefix>|any} [log]`

Parameter	Description
<i><list-name></i>	A user-defined name for the IPv6 software extended access- list.
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
proto	The IP Protocol type specified by its protocol number in the range 1 to 255.
<i><ip-protocol></i>	The IP protocol number, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.
<i><ipv6-source-address/prefix></i>	IPv6 source address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
any	Any source address or local address.
<i><ipv6-destination-address/prefix></i>	IPv6 destination address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
any	Any destination address or remote address.
log	Log the results.

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]

Protocol Number	Protocol Description [RFC]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)
89	OSPFv2 [RFC1583]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768

Protocol Number	Protocol Description [RFC]
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use IPv6 extended access-lists to control the transmission of IPv6 packets on an interface, and restrict the content of routing updates. The switch stops checking the IPv6 extended access-list when a match is encountered.

The filter entry will match on any IP protocol type packet that has the specified source and destination IPv6 addresses and the specified IP protocol type. The parameter any may be specified if an address does not matter.

NOTE: Software ACLs will access unless by an ACL action.

Examples To create the IPv6 access-list named ACL -1 to deny IP protocol 9 packets from 2001:0db8:1::1/128 to 2001:0db8:f::1/128, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended ACL-1 deny proto 9
2001:0db8:1::1/128 2001:0db8:f::1/128
```

To remove the IPv6 access-list named ACL -1 to deny IP protocol 9 packets from 2001:0db8:1::1/128 to 2001:0db8:f::1/128, use the commands:

```
awplus# configure terminal
awplus(config)# no ipv6 access-list extended ACL-1 deny proto 10
2001:0db8:1::1/128 2001:0db8:f::1/128
```

Related commands **ipv6 access-list extended (named)**
(ipv6 access-list extended IP protocol filter)
show ipv6 access-list (IPv6 Software ACLs)
show running-config

(ipv6 access-list extended IP protocol filter)

Overview Use this ACL filter to add a filter entry for an IPv6 source and destination address and prefix, with or without an IP protocol specified, to the current extended IPv6 access-list. If a sequence is specified, the new entry is inserted at the specified location. Otherwise, the new entry is added at the end of the access-list.

The **no** variant of this command removes a filter entry for an IPv6 source and destination address and prefix, with or without an IP protocol filter entry, from the current extended IPv6 access-list. You can specify the ACL filter entry by entering either its sequence number, or its filter entry profile.

Syntax [ip|proto] [*<sequence-number>*] {deny|permit} {ip|any|proto *<ip-protocol>*} {*<ipv6-source-address/prefix>*|any} {*<ipv6-destination-address/prefix>*|any} [log]
no {deny|permit} {ip|any|proto *<ip-protocol>*} {*<ipv6-source-address/prefix>*|any} {*<ipv6-destination-address/prefix>*|any} [log]
no [*<sequence-number>*]

Parameter	Description
<i><sequence-number></i>	<i><1-65535></i> The sequence number for the filter entry of the selected access control list.
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
ip	IP packet.
any	Any packet.
proto <i><ip-protocol></i>	<i><1-255></i> Specify IP protocol number, as defined by IANA (Internet Assigned Numbers Authority www.iana.org/assignments/protocol-numbers) See below for a list of IP protocol numbers and their descriptions.
<i><ipv6-source- address/prefix></i>	IPv6 source address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
any	Any source address or local address.
<i><ipv6- destination- address/prefix></i>	IPv6 destination address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
any	Any destination address or remote address.
log	Log the results.

IP protocol number and description

Protocol Number	Protocol Description [RFC]
1	Internet Control Message [RFC792]

Protocol Number	Protocol Description [RFC]
2	Internet Group Management [RFC1112]
3	Gateway-to-Gateway [RFC823]
4	IP in IP [RFC2003]
5	Stream [RFC1190] [RFC1819]
6	TCP (Transmission Control Protocol) [RFC793]
8	EGP (Exterior Gateway Protocol) [RFC888]
9	IGP (Interior Gateway Protocol) [IANA]
11	Network Voice Protocol [RFC741]
17	UDP (User Datagram Protocol) [RFC768]
20	Host monitoring [RFC869]
27	RDP (Reliable Data Protocol) [RFC908]
28	IRTP (Internet Reliable Transaction Protocol) [RFC938]
29	ISO-TP4 (ISO Transport Protocol Class 4) [RFC905]
30	Bulk Data Transfer Protocol [RFC969]
33	DCCP (Datagram Congestion Control Protocol) [RFC4340]
48	DSR (Dynamic Source Routing Protocol) [RFC4728]
50	ESP (Encap Security Payload) [RFC2406]
51	AH (Authentication Header) [RFC2402]
54	NARP (NBMA Address Resolution Protocol) [RFC1735]
58	ICMP for IPv6 [RFC1883]
59	No Next Header for IPv6 [RFC1883]
60	Destination Options for IPv6 [RFC1883]
88	EIGRP (Enhanced Interior Gateway Routing Protocol)
89	OSPFv2 [RFC1583]

Protocol Number	Protocol Description [RFC]
97	Ethernet-within-IP Encapsulation / RFC3378
98	Encapsulation Header / RFC1241
108	IP Payload Compression Protocol / RFC2393
112	Virtual Router Redundancy Protocol / RFC3768
134	RSVP-E2E-IGNORE / RFC3175
135	Mobility Header / RFC3775
136	UDPLite / RFC3828
137	MPLS-in-IP / RFC4023
138	MANET Protocols / RFC-ietf-manet-iana-07.txt
139-252	Unassigned / IANA
253	Use for experimentation and testing / RFC3692
254	Use for experimentation and testing / RFC3692
255	Reserved / IANA

Mode IPv6 Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes The filter entry will match on any IP protocol type packet that has the specified source and destination IPv6 addresses and the specified IP protocol type. The parameter any may be specified if an address does not matter.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples To add a new ACL filter entry to the extended IPv6 access-list named my-list with sequence number 5 rejecting the IPv6 packet from 2001:db8:1:1 to 2001:db8:f:1, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# 5 deny ip 2001:db8:1::1/128
2001:db8:f::1/128
```

To remove the ACL filter entry to the extended IPv6 access-list named my-list with sequence number 5, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# no 5
```

Related commands **ipv6 access-list extended (named)**
show ipv6 access-list (IPv6 Software ACLs)
show running-config

(ipv6 access-list extended TCP UDP filter)

Overview Use this ACL filter to add a filter entry for an IPv6 source and destination address and prefix, with a TCP (Transmission Control Protocol) or UDP (User Datagram Protocol) source and destination port specified, to the current extended IPv6 access-list. If a sequence number is specified, the new entry is inserted at the specified location. Otherwise, the new entry is added at the end of the access-list.

The **no** variant of this command removes a filter entry for an IPv6 source and destination address and prefix, with a TCP or UDP source and destination port specified, from the current extended IPv6 access-list. You can specify the filter entry for removal by entering either its sequence number, or its filter entry profile.

Syntax [tcp|udp] [*<sequence-number>*] {deny|permit} {tcp|udp} {<ipv6-source-address/prefix>|any} {eq <sourceport>|lt <sourceport>|gt <sourceport>|ne <sourceport>} {<IPv6-destination-address/prefix>|any} {eq <destport>|lt <destport>|gt <destport>|ne <destport>} [log]

no {deny|permit} {tcp|udp} {<ipv6-source-address/prefix>|any} {eq <sourceport>|lt <sourceport>|gt <sourceport>|ne <sourceport>}} {<IPv6-destination-address/prefix>|any} {eq <destport>|lt <destport>|gt <destport>|ne <destport>} [log]

no <sequence-number>

Parameter	Description
<i><sequence-number></i>	<1-65535> The sequence number for the filter entry of the selected access control list.
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
tcp	TCP packet.
udp	UDP packet.
<i><ipv6-source-address/prefix></i>	IPv6 source address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
any	Any source address or local address.
eq	Equal to.
lt	Less than.
gt	Greater than.
ne	Not equal to.
<i><sourceport></i>	The source port number, specified as an integer between 0 and 65535.
<i><ipv6-destination-address/prefix></i>	IPv6 destination address, or local address. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<i><destport></i>	The destination port number, specified as an integer between 0 and 65535.
log	Log the results.

Mode IPv6 Extended ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes The filter entry will match on any packet that has the specified source and destination IPv6 addresses and the specified TCP or UDP source and destination port. The parameter any may be specified if an address does not matter.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples To add a new filter entry with sequence number 5 to the access-list named my-list to reject TCP packets from 2001:0db8::0/64 port 10 to 2001:0db8::f/64 port 20, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# 5 deny tcp 2001:0db8::0/64 eq 10
2001:0db8::f/64 eq 20
```

To add a new filter entry with sequence number 5 to the extended IPv6 access-list named my-list to reject UDP packets from 2001:0db8::0/64 port 10 to 2001:0db8::f/64 port 20, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# 5 deny udp 2001:0db8::0/64 eq 10
2001:0db8::f/64 eq 20
```

To remove the filter entry with sequence number 5 to the extended IPv6 access-list named my-list, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list extended my-list
awplus(config-ipv6-ext-acl)# no 5
```

Related commands **ipv6 access-list extended (named)**
show ipv6 access-list (IPv6 Software ACLs)
show running-config

ipv6 access-list standard (named)

Overview This command configures an IPv6 standard access-list for filtering frames that permit or deny IPv6 packets from a specific source IPv6 address.

The **no** variant of this command removes a specified IPv6 standard access-list.

Syntax [list-name] `ipv6 access-list standard <ipv6-acl-list-name>`
`no ipv6 access-list standard <ipv6-acl-list-name>`

Parameter	Description
<code><ipv6-acl-list-name></code>	A user-defined name for the IPv6 software standard access-list.

Syntax [deny|permit] `ipv6 access-list standard <ipv6-acl-list-name> [{deny|permit} {<ipv6-source-address/prefix-length>|any} [exact-match]]`
`no ipv6 access-list standard <ipv6-acl-list-name> [{deny|permit} {<ipv6-source-address/prefix-length>|any} [exact-match]]`

Parameter	Description
<code><ipv6-acl-list-name></code>	A user-defined name for the IPv6 software standard access-list.
deny	The IPv6 software standard access-list rejects packets that match the type, source, and destination filtering specified with this command.
permit	The IPv6 software standard access-list permits packets that match the type, source, and destination filtering specified with this command.
<code><ipv6-source-address/prefix-length></code>	Specifies a source address and prefix length. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
any	Matches any source IPv6 address.
exact-match	Exact match of the prefixes.

Mode Global Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage notes Use IPv6 standard access-lists to control the transmission of IPv6 packets on an interface, and restrict the content of routing updates. The switch stops checking the IPv6 standard access-list when a match is encountered.

For backwards compatibility you can either create IPv6 standard access-lists from within this command, or you can enter `ipv6 access-list standard` followed by only the IPv6 standard access-list name. This latter (and preferred) method moves you to the `(config-ipv6-std-acl)` prompt for the selected IPv6 standard access-list, and from here you can configure the filters for this selected IPv6 standard access-list.

NOTE: *Software ACLs will access unless by an ACL action.*

Example To enter the IPv6 Standard ACL Configuration mode for the access-list named `my-list`, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard my-list
awplus(config-ipv6-std-acl)#
```

Related commands **([ipv6 access-list standard filter](#))**
[show ipv6 access-list \(IPv6 Software ACLs\)](#)
[show running-config](#)

(ipv6 access-list standard filter)

Overview Use this ACL filter to add a filter entry for an IPv6 source address and prefix length to the current standard IPv6 access-list. If a sequence number is specified, the new entry is inserted at the specified location. Otherwise, the new entry is added at the end of the access-list.

The **no** variant of this command removes a filter entry for an IPv6 source address and prefix from the current standard IPv6 access-list. You can specify the filter entry for removal by entering either its sequence number, or its filter entry profile.

Syntax [icmp] [*<sequence-number>*] {deny|permit} {*<ipv6-source-address/prefix-length>*|any}
no {deny|permit} {*<ipv6-source-address/prefix-length>*|any}
no *<sequence-number>*

Parameter	Description
<i><sequence-number></i>	<i><1-65535></i> The sequence number for the filter entry of the selected access control list.
deny	Specifies the packets to reject.
permit	Specifies the packets to accept.
<i><ipv6-source-address/prefix-length></i>	IPv6 source address and prefix-length in the form X:X::X:X/P.
any	Any IPv6 source host address.

Mode IPv6 Standard ACL Configuration

Default Any traffic controlled by a software ACL that does not explicitly match a filter is denied.

Usage The filter entry will match on any IPv6 packet that has the specified IPv6 source address and prefix length. The parameter any may be specified if an address does not matter.

NOTE: *Software ACLs will access unless by an ACL action.*

Examples To add an ACL filter entry with sequence number 5 that will deny any IPv6 packets to the standard IPv6 access-list named my-list, enter the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard my-list
awplus(config-ipv6-std-acl)# 5 deny any
```

To remove the ACL filter entry that will deny any IPv6 packets from the standard IPv6 access-list named my-list, enter the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard my-list
awplus(config-ipv6-std-acl)# no deny any
```

Alternately, to remove the ACL filter entry with sequence number 5 to the standard IPv6 access-list named my-list, enter the commands:

```
awplus# configure terminal
awplus(config)# ipv6 access-list standard my-list
awplus(config-ipv6-std-acl)# no 5
```

Related commands **ipv6 access-list standard (named)**
show ipv6 access-list (IPv6 Software ACLs)
show running-config

ipv6 prefix-list

Overview Use this command to create an IPv6 prefix list or an entry in an existing prefix list.

Use the **no** variant of this command to delete a whole prefix list, a prefix list entry, or a description.

Syntax `ipv6 prefix-list <list-name> [seq <1-429496725>] {deny|permit} {any|<ipv6-prefix>} [ge <0-128>] [le <0-128>]`
`ipv6 prefix-list <list-name> description <text>`
`no ipv6 prefix-list <list-name> [seq <1-429496725>]`
`no ipv6 prefix-list <list-name> [description <text>]`

Parameter	Description
<list-name>	Specifies the name of a prefix list.
seq <1-429496725>	Sequence number of the prefix list entry.
deny	Specifies that the prefixes are excluded from the list.
permit	Specifies that the prefixes are included in the list.
<ipv6-prefix>	Specifies the IPv6 prefix and prefix length in hexadecimal in the format X:X::X:X/M.
any	Any prefix match. Same as ::0/0 le 128.
ge <0-128>	Specifies the minimum prefix length to be matched.
le <0-128>	Specifies the maximum prefix length to be matched.
description	Prefix list specific description.
<text>	Up to 80 characters of text description of the prefix list.

Mode Global Configuration

Usage notes When the device processes a prefix list, it starts to match prefixes from the top of the prefix list, and stops whenever a permit or deny occurs. To promote efficiency, use the **seq** parameter and place common permits or denials towards the top of the list. If you do not use the **seq** parameter, the sequence values are generated in a sequence of 5.

The parameters **ge** and **le** specify the range of the prefix lengths to be matched. The parameters **ge** and **le** are only used if an ip-prefix is stated. When setting these parameters, set the **le** value to be less than 128, and the **ge** value to be less than or equal to the **le** value and greater than the ip-prefix mask length.

Prefix lists implicitly exclude prefixes that are not explicitly permitted in the prefix list. This means if a prefix that is being checked against the prefix list reaches the end of the prefix list without matching a permit or deny, this prefix will be denied.

Example To check the first 32 bits of the prefix 2001:db8:: and that the subnet mask must be greater than or equal to 34 and less than or equal to 40, enter the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 prefix-list mylist seq 12345 permit
                2001:db8::/32 ge 34 le 40
```

Related commands **match ipv6 address**
show ipv6 prefix-list
show running-config ipv6 prefix-list

show ipv6 access-list (IPv6 Software ACLs)

Overview Use this command to display all configured IPv6 access-lists or the IPv6 access-list specified by name.

Syntax show ipv6 access-list [<access-list-name>]
show ipv6 access-list standard [<access-list-name>]
show ipv6 access-list extended [<access-list-name>]

Parameter	Description
<access-list-name>	Only display information about an IPv6 access-list with the specified name.
standard	Only display information about standard access-lists.
extended	Only display information about extended access-lists.

Mode User Exec and Privileged Exec

Example To show all configured IPv6 access-lists, use the following command:
awplus# show ipv6 access-list

Output The following shows typical output.

Example output from show ipv6 access-list

```
IPv6 access-list deny_icmp
deny icmp any any vlan 1

IPv6 access-list deny_ssh
deny tcp abcd::0/64 any eq 22
```

Example To show the IPv6 access-list named **deny_icmp**, use the following command:
awplus# show ipv6 access-list deny_icmp

Output The following shows typical output.

Example output from show ipv6 access-list for a named ACL

```
IPv6 access-list deny_icmp  
deny icmp any any v1an 1
```

Related commands

- ipv6 access-list extended (named)**
(ipv6 access-list extended IP protocol filter)
- ipv6 access-list standard (named)**
(ipv6 access-list extended TCP UDP filter)
- (ipv6 access-list standard filter)**

show ipv6 prefix-list

Overview Use this command to display the prefix-list entries.

Note that this command is valid for RIPng only.

Syntax `show ipv6 prefix-list [<name>|detail|summary]`

Parameter	Description
<name>	Specify the name of an individual IPv6 prefix list.
detail	Specify this parameter to show detailed output for all IPv6 prefix lists.
summary	Specify this parameter to show summary output for all IPv6 prefix lists.

Mode User Exec and Privileged Exec

Example `awplus# show ipv6 prefix-list`
`awplus# show ipv6 prefix-list 10.10.0.98/8`
`awplus# show ipv6 prefix-list detail`

Related commands [ipv6 prefix-list](#)

vty ipv6 access-class (named)

Overview For IPv6, use this command to set a standard named software access list to be the management ACL. This is then applied to all available VTY lines for controlling remote access by Telnet and SSH. This command allows or denies packets containing the IPv6 addresses included in the ACL to create a connection to your device.

ACLs that are attached using this command have an implicit 'deny-all' filter as the final entry in the ACL. A typical configuration is to permit a specific address, or range of addresses, and rely on the 'deny-all' filter to block all other access.

Use the **no** variant of this command to remove the access list.

Syntax vty ipv6 access-class <access-name>
no vty ipv6 access-class [<access-name>]

Parameter	Description
<access-name>	Specify an IPv6 standard software access-list name

Mode Global Configuration

Examples To set the named standard access-list named **access-ctrl** to be the IPv6 management ACL, use the following commands:

```
awplus# configure terminal
awplus(config)# vty ipv6 access-class access-ctrl
```

To remove **access-ctrl** from the management ACL, use the following commands:

```
awplus# configure terminal
awplus(config)# no vty ipv6 access-class access-ctrl
```

Output The following shows typical output.

Example output from the show running-config command

```
awplus#show running-config|grep access-class
 vty ipv6 access-class access-ctrl
```

Related commands [show running-config](#)
[vty access-class \(numbered\)](#)

41

QoS and Policy-based Routing Commands

- Contents**
- **Introduction** on page 2014
 - **class** on page 2015
 - **class-map** on page 2016
 - **clear mls qos interface policer-counters** on page 2017
 - **clear mls qos interface queue-counters** on page 2018
 - **default-action** on page 2019
 - **description (QoS policy-map)** on page 2021
 - **egress-rate-limit** on page 2022
 - **egress-rate-limit overhead** on page 2023
 - **match access-group** on page 2024
 - **match cos** on page 2026
 - **match dscp** on page 2027
 - **match eth-format protocol** on page 2028
 - **match inner-cos** on page 2033
 - **match inner-tpid** on page 2034
 - **match inner-vlan** on page 2035
 - **match ip-precedence** on page 2036
 - **match mac-type** on page 2037
 - **match tcp-flags** on page 2038
 - **match tpid** on page 2039
 - **match vlan** on page 2040
 - **mls qos aggregate-police action** on page 2041
 - **mls qos aggregate-police counters** on page 2043
 - **mls qos cos** on page 2044
 - **mls qos enable** on page 2045
 - **mls qos map cos-queue** on page 2046
 - **mls qos map premark-dscp** on page 2047
 - **mls qos queue** on page 2050
 - **mls qos queue name** on page 2051
 - **mls qos scheduler-set** on page 2052
 - **mls qos scheduler-set priority-queue** on page 2053
 - **mls qos scheduler-set wrr-queue group** on page 2054
 - **no police** on page 2056
 - **police-aggregate** on page 2057
 - **police counters** on page 2058
 - **police single-rate action** on page 2059
 - **police twin-rate action** on page 2061

- **policy-map** on page 2063
- **service-policy input** on page 2064
- **set bandwidth-class** on page 2065
- **set cos** on page 2068
- **set dscp** on page 2070
- **set ip next-hop (PBR)** on page 2072
- **set queue** on page 2074
- **show class-map** on page 2076
- **show mls qos** on page 2077
- **show mls qos aggregate-policer** on page 2078
- **show mls qos interface** on page 2079
- **show mls qos interface policer-counters** on page 2082
- **show mls qos interface queue-counters** on page 2084
- **show mls qos interface storm-status** on page 2086
- **show mls qos maps cos-queue** on page 2087
- **show mls qos maps premark-dscp** on page 2088
- **show mls qos scheduler-set** on page 2089
- **show platform classifier statistics utilization brief** on page 2092
- **show policy-map** on page 2097
- **storm-action** on page 2098
- **storm-downtime** on page 2100
- **storm-protection** on page 2101
- **storm-rate** on page 2102
- **storm-window** on page 2103
- **strict-priority-queue egress-rate-limit queues** on page 2104
- **strict-priority-queue queue-limit** on page 2105
- **trust dscp** on page 2106
- **wrr-queue disable queues** on page 2108
- **wrr-queue egress-rate-limit queues** on page 2109
- **wrr-queue queue-limit** on page 2110

Introduction

Overview This chapter provides an alphabetical reference for Quality of Service commands.

QoS uses ACLs. For more information about ACLs, see the [ACL Feature Overview and Configuration Guide](#).

For more information about PBR, see the [Policy-Based Routing Feature Overview and Configuration Guide](#).

class

Overview Use this command to associate an existing class-map to a policy or policy-map (traffic classification), and to enter Policy Map Class Configuration mode to configure the class- map.

Use the **no** variant of this command to delete an existing class-map.

If your class-map does not exist, you can create it by using the **class-map** command.

Syntax class {<name>|default}
no class <name>

Parameter	Description
<name>	Name of the (already existing) class-map.
default	Specify the default class-map.

Mode Policy Map Configuration

Example The following example creates the policy-map pmap1(using the policy-map command), then associates this to an already existing class-map named cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)#
```

Related commands **class-map**
policy-map

class-map

Overview Use this command to create a class-map.
Use the **no** variant of this command to delete the named class-map.

Syntax class-map <name>
no class-map <name>

Parameter	Description
<name>	Name of the class-map to be created.

Mode Global Configuration

Example This example creates a class-map called cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)#
```

clear mls qos interface policer-counters

Overview Resets an interface's policer counters to zero. You can either clear a specific class-map, or you can clear all class-maps by not specifying a class map.

Syntax `clear mls qos interface <port> policer-counters [class-map <class-map>]`

Parameter	Description
<port>	The port may be a switch port (e.g. port1.0.4), a static channel group (e.g. sa3), or a dynamic (LACP) channel group (e.g. po4).
class-map	Select a class-map.
<class-map>	Class-map name.

Mode Privileged Exec

Example To reset the policy counters to zero for all class-maps for port1.0.4, use the command:

```
awplus# clear mls qos interface port1.0.4 policer-counters
```

Related commands [show mls qos interface policer-counters](#)

clear mls qos interface queue-counters

Overview Use this command to clear the QoS queue counters for an interface.

Syntax clear mls qos interface <interface> queue-counters

Parameter	Description
<interface>	The interface to clear the counters for. This can be a switchport, a static channel group, or a dynamic (LACP) channel group.

Mode Privileged Exec

Example To clear the egress queue counters on interface port1.0.1, use the command:

```
awplus# clear mls qos interface port1.0.1 queue-counters
```

To clear the egress queue counters on the static aggregator sa1, use the command:

```
awplus# clear mls qos interface sa1 queue-counters
```

Related commands [show mls qos interface queue-counters](#)

Command changes Version 5.5.2-2.1: command added

default-action

Overview Use this command to set the action for the default class-map belonging to a particular policy-map. The action for a non-default class-map depends on the action of any ACL that is applied to the policy-map.

You can think of the default action as the action that the switch will apply to any data that does not meet the criteria specified by the applied matching commands.

Use the **no** variant of this command to reset to the default action of 'permit'.

Syntax default-action <action>
no default-action

Parameter		Description
<action>	permit	Permit packets
	deny	Deny packets.
	send-to-cpu	Send packets to the CPU.
	copy-to-cpu	Copy packets to the CPU as well as forwarding them.
	copy-to-mirror [interface <i>port-number</i>]	Copy packets to the mirror port as well as forwarding them. Use the mirror interface command to configure the mirror port. If there are multiple mirror ports and you do not specify one, then the switch will use the mirror port with the lowest port number.

Default The default is **permit**.

Mode Policy Map Configuration

Examples To set the action for the default class-map to 'deny' for the policy map named 'map1', use the commands:

```
awplus# configure terminal
awplus(config)# mls qos enable
awplus(config)# policy-map map1
awplus(config-pmap)# default-action deny
```

To set the action for the default class-map to 'copy-to-mirror' for use with the **mirror interface** command, for the policy map named 'map1', use the commands:

```
awplus# configure terminal
awplus(config)# mls qos enable
awplus(config)# policy-map map1
awplus(config-pmap)# default-action copy-to-mirror
```

Related commands **mirror interface**

description (QoS policy-map)

Overview Adds a textual description of the policy-map. This can be up to 80 characters long.

Use the **no** variant of this command to remove the current description from the policy-map.

Syntax `description <line>`
`no description`

Parameter	Description
<code><line></code>	Up to 80 character long line description.

Mode Policy Map Configuration

Example To add the description, VOIP traffic, use the command:

```
awplus(config-pmap)# description VOIP traffic
```

egress-rate-limit

Overview Use this command to limit the amount of traffic that can be transmitted per second from this port.

Use the **no** variant of this command to disable the limiting of traffic egressing on the interface.

Syntax egress-rate-limit <rate-limit>
no egress-rate-limit

Parameter	Description
<rate-limit>	Bandwidth <1-10000000 units per second> (usable units: k, m, g). Not all values of egress rate limit are valid. If you enter an invalid number, the switch will round it up to the nearest valid value. The default unit is Kb (k), but Mb (m) or Gb (g) can also be specified. The command syntax is not case sensitive, so a value such as 20m or 20M will be interpreted as 20 megabits.

Mode Interface Configuration

Usage notes You cannot use this command at the same time as the **wrr-queue queue-limit** or **strict-priority-queue queue-limit** commands.

Examples To enable egress rate limiting on a port, with a limit of approximately 500Mbps, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# egress-rate-limit 500m
```

To disable egress rate limiting on a port, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no egress-rate-limit
```

Related commands **egress-rate-limit overhead**

egress-rate-limit overhead

Overview Use this command to allow for the size of packet preamble and inter-packet gap (the “overhead”) in egress queue rate limiting on switch ports.

Doing this keeps the rate limit at the same percentage of line rate for all packet sizes. Otherwise, the percentage of line rate changes with packet size, because of the size of the overhead relative to smaller packets. This means smaller packets take up a larger percentage of the line rate.

Use the **no** variant of this command to turn off the overhead allowance.

Syntax egress-rate-limit overhead <bytes>
no egress-rate-limit overhead

Parameter	Description
<bytes>	The number of bytes to allow for overhead. For standard ethernet packets, use a value of 20 bytes (8 bytes of preamble and a inter-packet gap of 12 bytes).

Default No overhead allowance

Mode Interface Configuration

Example To configure an overhead allowance of 20 bytes (8 bytes of preamble and a inter-packet gap of 12 bytes) on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# egress-rate-limit overhead 20
```

To return port1.0.1 to the default of no overhead allowance, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no egress-rate-limit overhead
```

Related commands [egress-rate-limit](#)

Command changes Version 5.4.9-2.1: command added

match access-group

Overview Use this command to apply an ACL to a class-map or VLAN.

Use the **no** variant of this command to remove the match.

Syntax match access-group {<hw-IP-ACL>|<hw-MAC-ACL>|<hw-named-ACL>}
no match access-group {<hw-IP-ACL>|<hw-MAC-ACL>|<hw-named-ACL>}

Parameter	Description
<hw-IP-ACL>	Specify a hardware IP ACL number in the range <3000-3699>.
<hw-MAC-ACL>	Specify a hardware MAC ACL number in the range <4000-4699>.
<hw-named-ACL>	Specify a hardware named ACL (IP, IPv6 or MAC address entries).

Mode Class Map or VLAN Access-Map

Usage notes First create an access-list that applies the appropriate action to matching packets. Then use the **match access-group** command to apply this access-list as desired. Note that this command will apply the access-list matching only to *incoming* data packets.

Examples To configure a class-map named "cmap1", which matches traffic against access-list 3001, which allows IP traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 3001 permit ip any any
awplus(config)# class-map cmap1
awplus(config-cmap)# match access-group 3001
```

To configure a class-map named "cmap2", which matches traffic against access-list 4001, which allows MAC traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 4001 permit any any
awplus(config)# class-map cmap2
awplus(config-cmap)# match access-group 4001
```

To configure a class-map named "cmap3", which matches traffic against access-list "hw_acl", which allows IP traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list hardware hw_acl
awplus(config-ip-hw-acl)# permit ip any any
awplus(config)# class-map cmap3
awplus(config-cmap)# match access-group hw_acl
```

To apply ACL 3001 to VLAN 48, where the ACL drops IP traffic from any source to any destination, use the commands:

```
awplus# configure terminal
awplus(config)# access-list 3001 deny ip any any
awplus(config)# vlan access-map deny_all
awplus(config-vlan-access-map)# match access-group 3001
awplus(config-vlan-access-map)# exit
awplus(config)# vlan filter deny_all vlan-list 48 input
```

Related commands [class-map](#)
[vlan access-map](#)

Command changes Version 5.4.6-2.1: support for VLAN access-maps added

match cos

Overview Use this command to define a CoS to match against incoming packets.
Use the **no** variant of this command to remove CoS.

Syntax match cos <0-7>
no match cos

Parameter	Description
<0-7>	Specify the CoS value.

Mode Class Map Configuration

Examples To set the class-map's CoS to 4, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match cos 4
```

To remove CoS from a class-map, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match cos
```

match dscp

Overview Use this command to define the DSCP to match against incoming packets.
Use the **no** variant of this command to remove a previously defined DSCP.

Syntax match dscp <0-63>
no match dscp

Parameter	Description
<0-63>	Specify DSCP value (only one value can be specified).

Mode Class Map Configuration

Usage Use the **match dscp** command to define the match criterion after creating a class-map.

Examples To configure a class-map named cmap1 with criterion that matches DSCP 56, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match dscp 56
```

To remove a previously defined DSCP from a class-map named cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match dscp
```

Related commands [class-map](#)

match eth-format protocol

Overview This command sets the Ethernet format and the protocol for a class-map to match on.

Select one Layer 2 format and one Layer 3 protocol when you issue this command.

Use the **no** variant of this command to remove the configured Ethernet format and protocol from a class-map.

Syntax match eth-format <layer-two-format> protocol <layer-three-protocol>

no match eth-format protocol

The following eth-formats and protocols are available (note that not all options are available on all AlliedWare Plus switch models):

Parameter	Description
<layer-two-formats>	
802dot2-tagged	802.2 Tagged Packets (enter the parameter name).
802dot2-untagged	802.2 Untagged Packets (enter the parameter name).
ethii-tagged	EthII Tagged Packets (enter the parameter name).
ethii-untagged	EthII Untagged Packets (enter the parameter name).
ethii-any	EthII Tagged or Untagged Packets (enter the parameter name).
netwareraw-tagged	Netware Raw Tagged Packets (enter the parameter name).
netwareraw-untagged	Netware Raw Untagged Packets (enter the parameter name).
snap-tagged	SNAP Tagged Packets (enter the parameter name).
snap-untagged	SNAP Untagged Packets (enter the parameter name).
<layer-three-protocols>	
<word>	A Valid Protocol Number in hexadecimal.
any	Note that the parameter "any" is only valid when used with the netwarerawtagged and netwarerawuntagged protocol options.
sna-path-control	Protocol Number 04 (enter the parameter name or its number).
proway-lan	Protocol Number 0E (enter the parameter name or its number).
eia-rs Protocol	Number 4E (enter the parameter name or its number).

Parameter	Description
proway Protocol	Number 8E (enter the parameter name or its number).
ipx-802dot2	Protocol Number E0 (enter the parameter name or its number).
netbeui	Protocol Number F0 (enter the parameter name or its number).
iso-clns-is	Protocol Number FE (enter the parameter name or its number).
xdot75-internet	Protocol Number 0801(enter the parameter name or its number).
nbs-internet	Protocol Number 0802 (enter the parameter name or its number).
ecma-internet	Protocol Number 0803 (enter the parameter name or its number).
chaosnet	Protocol Number 0804 (enter the parameter name or its number).
xdot25-level-3	Protocol Number 0805 (enter the parameter name or its number).
arp Protocol	Number 0806 (enter the parameter name or its number).
xns-compatible	Protocol Number 0807 (enter the parameter name or its number).
banyan-systems	Protocol Number 0BAD (enter the parameter name or its number).
bbn-simnet	Protocol Number 5208 (enter the parameter name or its number).
dec-mop-dump-ld	Protocol Number 6001 (enter the parameter name or its number).
dec-mop-rem-cdons	Protocol Number 6002 (enter the parameter name or its number).
dec-decnet	Protocol Number 6003 (enter the parameter name or its number).
dec-lat	Protocol Number 6004 (enter the parameter name or its number).
dec-diagnostic	Protocol Number 6005 (enter the parameter name or its number).

Parameter	Description
dec-customer	Protocol Number 6006 (enter the parameter name or its number).
dec-lavc	Protocol Number 6007 (enter the parameter name or its number).
rarp	Protocol Number 8035 (enter the parameter name or its number).
dec-lanbridge	Protocol Number 8038 (enter the parameter name or its number).
dec-encryption	Protocol Number 803D (enter the parameter name or its number).
appletalk	Protocol Number 809B (enter the parameter name or its number).
ibm-sna	Protocol Number 80D5 (enter the parameter name or its number).
appletalk-aarp	Protocol Number 80F3 (enter the parameter name or its number).
snmp	Protocol Number 814CV.
ethertalk-2	Protocol Number 809B (enter the parameter name or its number).
ethertalk-2-aarp	Protocol Number 80F3 (enter the parameter name or its number).
ipx-snap	Protocol Number 8137 (enter the parameter name or its number).
ipx-802dot3	Protocol Number FFFF (enter the parameter name or its number).
ip	Protocol Number 0800 (enter the parameter name or its number).
ipx	Protocol Number 8137 (enter the parameter name or its number).
ipv6	Protocol Number 86DD (enter the parameter name or its number).

Mode Class Map Configuration

Examples To set the eth-format to ethii-tagged and the protocol to 0800 (IP) for class-map cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match eth-format ethii-tagged protocol 0800
awplus(config-cmap)# match eth-format ethii-tagged protocol ip
```

To remove the eth-format and the protocol from the class-map cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match eth-format protocol
```

match inner-cos

Overview Sets the Inner CoS for a class-map to match on.
Use the **no** variant of this command to remove CoS.

Syntax match inner-cos <0-7>
no match inner-cos

Parameter	Description
<0-7>	Specify the Inner CoS value.

Mode Class Map Configuration

Examples To set the class-map's inner-cos to 4, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match inner-cos 4
```

To remove CoS from the class-map, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match inner-cos
```

match inner-tpid

Overview Sets the Inner Tag Protocol Identifier (TPID) for a class-map to match on.
Use the **no** variant of this command to remove the TPID for a class-map.

Syntax `match inner-tpid <tpid>`
`no match inner-tpid`

Parameter	Description
<code><tpid></code>	Two byte hexadecimal number representing the TPID.

Mode Class Map Configuration

Examples To set the class-map's inner-tpid to 0x9100, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match inner-tpid 0x9100
```

To remove the class-map's inner-tpid, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match inner-tpid
```

match inner-vlan

Overview Use this command to define the inner VLAN ID as match criteria.

Use the **no** variant of this command to disable the VLAN ID used as match criteria.

Syntax match inner-vlan <1-4094>
no match inner-vlan

Parameter	Description
<1-4094>	The VLAN number.

Mode Class Map Configuration

Usage notes This command is used in double-tagged networks to match on a VLAN ID belonging to the client network. For more information on VLAN double-tagged networks, see the [VLAN_Feature Overview and Configuration Guide](#).

Examples To configure a class-map named cmap1 to match traffic from inner VLAN 3, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match inner-vlan 3
```

To disable the configured VLAN ID as a match criteria for the class-map named cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match inner-vlan
```

match ip-precedence

Overview Use this command to identify IP precedence values as match criteria.
Use the **no** variant of this command to remove IP precedence values from a class-map.

Syntax match ip-precedence <0-7>
no match ip-precedence

Parameter	Description
<0-7>	The precedence value to be matched.

Mode Class Map Configuration

Example To configure a class-map named cmap1 to match all IPv4 packets with a precedence value of 5, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match ip-precedence 5
```


match mac-type

Overview Use this command to set the MAC type for a class-map to match on.
Use **no** variant of this command to remove the MAC type match entry.

Syntax match mac-type {l2mcast|l2ucast}
no match mac-type

Parameter	Description
l2mcast	Layer 2 Multicast and Broadcast traffic.
l2ucast	Layer 2 Unicast traffic.

Mode Class Map Configuration

Examples To set the class-map's MAC type to Layer 2 multicast, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match mac-type l2mcast
```

To remove the class-map's MAC type entry, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match mac-type
```

match tcp-flags

Overview Sets one or more TCP flags (control bits) for a class-map to match on.

Use the **no** variant of this command to remove one or more TCP flags for a class-map to match on.

Syntax match tcp-flags [ack] [fin] [psh] [rst] [syn] [urg]
no match tcp-flags [ack] [fin] [psh] [rst] [syn] [urg]

Parameter	Description
ack	Acknowledge.
fin	Finish.
psh	Push.
rst	Reset.
syn	Synchronize.
urg	Urgent.

Mode Class Map Configuration

Examples To set the class-map's TCP flags to **ack** and **syn**, use the commands:

```
awplus# configure terminal
awplus(config)# class-map
awplus(config-cmap)# match tcp-flags ack syn
```

To remove the TCP flags **ack** and **rst**, use the commands:

```
awplus# configure terminal
awplus(config)# class-map
awplus(config-cmap)# no match tcp-flags ack rst
```

match tpid

Overview Sets the Tag Protocol Identifier (TPID) for a class-map to match on.
Use the **no** variant of this command to remove the TPID for a class-map.

Syntax match tpid <tpid>
no match tpid

Parameter	Description
<tpid>	Specify the Tag Protocol Identifier.

Mode Class Map Configuration

Examples To set the TPID of class-map named cmap1 to 0x9100, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match tpid 0x9100
```

To remove the TPID set previously for class-map named cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match tpid
```

match vlan

Overview Use this command to define the VLAN ID as match criteria.

Use the **no** variant of this command to disable the VLAN ID used as match criteria.

Syntax match vlan <1-4094>
no match vlan

Parameter	Description
<1-4094>	The VLAN number.

Mode Class Map Configuration

Examples To configure a class-map named cmap1 to include traffic from VLAN 3, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# match vlan 3
```

To disable the configured VLAN ID as a match criteria for the class-map named cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# class-map cmap1
awplus(config-cmap)# no match vlan
```

mls qos aggregate-police action

Overview This command creates or reconfigures an aggregate-policer for a class-map.

The **no** variant of this command removes a previously configured exceed action.

Syntax For single rate metering:

```
mls qos aggregate-police <name> single-rate <CIR> <CBS> <EBS>  
action [drop-red|transmit]
```

For twin rate metering:

```
mls qos aggregate-police <name> twin-rate <CIR> <CBS> <EIR>  
<PBS> action [drop-red|transmit]
```

```
no mls qos aggregate-police <name>
```

Parameter	Description
<name>	Specify aggregate-policer name.
single-rate	Single rate meter (one rate and two burst sizes).
twin-rate	Twin rate meter (two rates and two burst sizes).
<CIR>	The Committed Information Rate. Specify an average traffic rate, 1-16000000 (kbps).
<CBS>	The amount by which the data is allowed to burst beyond the value set by the CIR. Specify a value from 0-16777216 (bytes).
<EIR>	Excess Information Rate. Specify an average traffic rate, 1-16000000 (kbps).
<EBS>	For single-rate metering, this is the amount by which the data is allowed to burst beyond the value set by the CIR.
<PBS>	For twin-rate metering, this is the amount by which the data is allowed to burst beyond the value set by the EIR. Specify a value from 1-16777216 (bytes).
action	Specify the action: either drop-red or policed-dscp-transmit.
drop-red	Drop the red packets.
transmit	Packets are sent without modification.

Mode Global Configuration

Usage notes A policer can be used to meter the traffic classified by the class-map and as a result will be given one of three bandwidth classes. These are green (conforming), yellow (partially-conforming), and red (non-conforming).

Once you have created an aggregate policer, you can use the **police-aggregate** to assign it to one or more class-maps. This enables traffic classified by different characteristics to have accumulative application to the same policer. Another application of aggregate policers is to attach them to a single class-map but apply the class-maps to multiple ports (via its policy-map). This enables the same traffic to have accumulative policed application over multiple ports.

A single-rate policer is based on three values. These are:

- average rate (or Committed Information Rate CIR)
- minimum burst (or Committed Burst Size CBS)
- maximum burst (or Excess Burst Size EBS)

Traffic is classed as green if the rate is less than the combined CIR plus CBS values. Traffic is classed as yellow if the data rate is between the CBS and the EBS. Traffic is classed as red if the rate exceeds the average rate and the EBS.

A dual-rate policer is based on four values. These are:

- average rate (or Committed Information Rate CIR)
- minimum burst (or Committed Burst Size CBS)
- maximum burst (or Excess Burst Size EBS)
- Excess Information Rate (EIR)

Traffic is classed as green if the rate is less than the CIR and CBS. Traffic is classed as yellow if the rate is between the CBS and the EBS. Traffic is classed as red if the rate exceeds the average rate and the EBS.

Using an action of **drop-red** will result in all packets classed as red being discarded.

Example To create a single rate meter measuring traffic of 10 Mbps that drops any traffic bursting over 30000 bytes, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos aggregate-police ap1 single-rate 10000
                20000 30000 action drop-red
```

police-aggregate

show mls qos aggregate-policer

mls qos aggregate-police counters

Overview Use this command to enable policer counters for an aggregate-policer. This command can be used separately or in conjunction with a traffic meter (single or twin-rate meters).

Use the **no** variant of this command to disable policer counters for an aggregate-policer.

Syntax mls qos aggregate-police <name> counters
no mls qos aggregate-police <name> counters

Parameter	Description
<name>	Specify aggregate-policer name.

Default Policer counters are disabled by default.

Mode Global Configuration

Example To enable policer counters for aggregate-policer MYPolicer, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# mls qos aggregate-police MyPolicer counters
```

To disable policer counters for aggregate-policer MYPolicer, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no mls qos aggregate-police MyPolicer counters
```

Related commands [police counters](#)
[police single-rate action](#)
[police twin-rate action](#)

mls qos cos

Overview This command assigns a CoS (Class of Service) user-priority value to untagged frames entering a specified interface. By default, all untagged frames are assigned a CoS value of 0.

Use the **no** variant of this command to return the interface to the default CoS setting for untagged frames entering the interface.

Syntax mls qos cos <0-7>
no mls qos cos

Parameter	Description
<0-7>	The Class of Service, user-priority value.

Default By default, all untagged frames are assigned a CoS value of 0. Note that for tagged frames, the default behavior is not to alter the CoS value.

Mode Interface Configuration

Example To assign a CoS user priority value of 2 to all untagged packets entering port1.0.1 to port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# mls qos cos 2
```


mls qos enable

Overview Use this command to enable QoS.

Note that traffic transmitted from the port will be dropped for up to 1 second after you enable QoS. A warning will display and you will be prompted for a confirmation before QoS is enabled.

Use the **no** variant of this command to globally disable QoS and remove all QoS configuration. The **no** variant of this command removes all class-maps, policy-maps, and policers that have been created. Running the **no mls qos** command will therefore remove all pre-existing QoS configurations on the switch.

Mode Global Configuration

Syntax mls qos enable
no mls qos

Example To enable QoS on the switch, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos enable
```

mls qos map cos-queue

Overview Use this command to set the default CoS to egress queue mapping. This is the default queue mapping for packets that do not get assigned an egress queue via any other QoS functionality.

Use the **no** variant of this command to reset the cos-queue map back to its default setting. The default mappings for this command are:

CoS Priority :	0	1	2	3	4	5	6	7

CoS QUEUE:	2	0	1	3	4	5	6	7

Syntax mls qos map cos-queue <cos-priority> to <queue-number>
no mls qos map cos-queue

Parameter	Description
<cos-priority>	CoS priority value. Can take a value between 0 and 7.
<queue-number>	Queue number. Can take a value between 0 and 7.

Mode Global Configuration

Examples To map CoS 2 to queue 0, use the command:

```
awplus# configure terminal
awplus(config)# mls qos map cos-queue 2 to 0
```

To set the cos-queue map back to its defaults, use the command:

```
awplus# configure terminal
awplus(config)# no mls qos map cos-queue
```

Related commands [show mls qos interface](#)

mls qos map premark-dscp

Overview This command configures the premark-dscp map. It is used when traffic is classified by a class-map that has **trust dscp** configured. Based on a lookup DSCP, the map determines new QoS settings for the traffic.

The **no** variant of this command resets the premark-dscp map to its defaults. If no DSCP is specified then all DSCP entries will be reset to their defaults.

Syntax `mls qos map premark-dscp <0-63> to
{[new-dscp <0-63>] [new-cos <0-7>] [new-queue <0-7>]
[new-bandwidth-class {green|yellow|red}]]}
no mls qos map premark-dscp [<0-63>]`

Parameter	Description
premark-dscp <0-63>	The DSCP value on ingress.
new-dscp <0-63>	The DSCP value that the packet will have on egress. If unspecified, this value will remain the DSCP ingress value.
new-cos <0-7>	The CoS value that the packet will have on egress. If unspecified, this value will retain its value on ingress.
new-queue <0-7>	Modify Egress Queue.
new-bandwidth-class	Modify Egress Bandwidth-class. If unspecified, this value will be set to green.
green	Egress Bandwidth-class green (marked down Bandwidth-class).
yellow	Egress Bandwidth-class yellow (marked down Bandwidth-class).
red	Egress Bandwidth-class red (marked down Bandwidth-class).

Mode Global Configuration

Usage notes With the **trust dscp** command set, this command (**mls qos map premark-dscp**) enables you to remap the DSCP, CoS, output queue, or bandwidth class values.

However, note that you cannot simultaneously change the DSCP and CoS, because they use the same byte in the IP header.

Used together, the premark-dscp map and the **trust dscp** command are one way to change packets' DSCP, bandwidth-class, CoS and queue. They act by assigning a QoS profile to traffic that matches the policy-map.

Alternatively, you can set these values explicitly for a class-map inside a policy-map, by using one of the commands:

- **set bandwidth-class**
- **set cos**
- **set dscp**
- **set queue**

Do not use a mixture of the **set** commands and the map.

This is because using any one (or more) of the **set** commands overrides the whole premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Example To send packets to queue 1 if they have a DSCP of 34, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos map premark-dscp 34 to new-queue 1
```

Example To set the entry for DSCP 1 to use a new DSCP of 2, use the command:

```
awplus# configure terminal
awplus(config)# mls qos map premark-dscp 1 to new-dscp 2
```

Example To set the entry for DSCP 1 to use a new CoS of 3, and a new bandwidth class of yellow, use the command:

```
awplus# configure terminal
awplus(config)# mls qos map premark-dscp 1 to new-cos 3 new-
bandwidth-class yellow
```

Example To reset the entry for DSCP 1 use the command:

```
awplus# configure terminal
awplus(config)# no mls qos map premark-dscp 1
```

Related commands

- set bandwidth-class**
- set cos**
- set dscp**
- set queue**
- show mls qos maps premark-dscp**
- trust dscp**

mls qos queue

Overview This command configures the default egress queue for any packet arriving on the specified interface. When no default queue is configured, the cos-queue map is used to choose the queue for the packet.

Use the **no** variant of this command to turn off the use of a default queue on the interface.

Syntax mls qos queue <0-7>
no mls qos queue

Parameter	Description
<0-7>	The particular queue number.

Mode Interface Configuration

Examples To set the default egress queue to 7, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# mls qos queue 7
```

To turn off the default queue usage on port1.0.1 use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no mls qos queue
```

Related commands [show mls qos interface](#)

mls qos queue name

Overview Use this command to give a name and optional description to a specific egress queue.

Use the **no** variant of this command to remove the name and description from an egress queue.

Syntax mls qos queue <0-7> name <name> [description <description>]
no mls qos queue <0-7> name

Parameter	Description
<0-7>	The number of the egress queue to name.
<name>	The name you want to give the egress queue. The name can contain any printable ASCII character (ASCII 33-126), except for spaces.
<description>	The description you want to give the egress queue. The description can contain any printable ASCII character (ASCII 32-126), including spaces.

Default Queues have no name or description

Mode Global Configuration

Example To give queue 6 the name 'Video' and the description 'Real-time interactive, broadcast video', use the commands:

```
awplus# configure terminal
awplus(config)# mls qos queue 6 name Video description Real-time
interactive, broadcast video
```

To remove the name and description from queue 6, use the commands:

```
awplus# configure terminal
awplus(config)# no mls qos queue 6 name
```

Command changes Version 5.5.2-2.1: command added

mls qos scheduler-set

Overview Use this command to set a scheduler-set on an interface.

Use the **no** variant of this command to reset an interface back to the default of strict priority.

Syntax mls qos scheduler-set <1-4>
no mls qos scheduler-set

Parameter	Description
<1-4>	Scheduler-set ID.

Mode Interface Configuration

Example To set port1.0.1 to use scheduler-set 1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# mls qos scheduler-set 1
```

To reset scheduler-set 1 back to strict priority, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no mls qos scheduler-set
```

Related commands [mls qos scheduler-set priority-queue](#)
[mls qos scheduler-set wrr-queue group](#)
[show mls qos scheduler-set](#)

Command changes Version 5.5.5-2.1: more scheduler-sets supported on some products

mls qos scheduler-set priority-queue

Overview Use this command to configure strict priority-based scheduling on the specified egress queues for a specific scheduler-set. You must specify at least one queue.

Syntax `mls qos scheduler-set <1-4> priority-queue [0][1][2][3][4][5][6][7]`

Parameter	Description
<1-4>	Scheduler-set ID.
[0][1]...[7]	Specify the egress queues to apply the scheduling rule to.

Mode Global Configuration

Example To apply priority based scheduling to egress queues 5, 6, and 7, for scheduler-set 1, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# mls qos scheduler-set 1 priority-queue 5 6 7
```

Related commands [mls qos scheduler-set wrr-queue group](#)
[show mls qos scheduler-set](#)

Command changes Version 5.5.5-2.1: more scheduler-sets supported on some products

mls qos scheduler-set wrr-queue group

Overview Use this command to configure weighted round-robin-based (WRR-based) scheduling on the specified egress queues for a specific scheduler-set.

You can group queues into one of two weighted round robin groups, called WRR1 and WRR2. Within each group, the queues will be emptied using a weighted round robin algorithm. There are two ways you can set the weights for the queues:

- Using the **weight** parameter, within each group, you must give each queue a relative weight. Within that group, the switch empties the queues in proportion to their weights. The exact weight values are irrelevant, as long as they result in the ratio you want.
- Using the **percent** parameter, within each group, you must give each queue a percentage. The percentages in that group must total to 100%. Within that group, the switch empties the queues based on the percentage.

WRR1 does not take priority over WRR2, or vice versa; priority is determined by the queue number. The switch first empties queue 7 and any other queues in the same WRR group as queue 7. Then it empties queue 6 and any other queues in the same WRR group as queue 6, and so on.

Syntax `mls qos scheduler-set <1-4> wrr-queue group <1-2> weight <1-255> queues [0][1][2][3][4][5][6][7]`
`mls qos scheduler-set <1-4> wrr-queue group <1-2> percent <1-100> queues [0][1][2][3][4][5][6][7]`

Parameter	Description
<1-4>	Scheduler-set ID.
<1-2>	WRR group 1 or 2.
<1-255>	Specify the weighting applied to the egress queues.
<1-100>	Specify the percentage applied to the egress queues.
[0][1]...[7]	Specify the egress queues to apply the scheduling rule to.

Mode Global Configuration

Example To configure wrr-queue group 2 applying a weighting value of 10 to queues 0 and 1 for scheduler-set 1, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos scheduler-set 1 wrr-queue group 2 weight
10 queues 0 1
```

To configure wrr-queue group 2 applying a weighting value of 20 to queues 2 and 3 for scheduler-set 1, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos scheduler-set 1 wrr-queue group 2 weight
20 queues 2 3
```

The switch will empty twice as many packets from queues 2 and 3 as it will from queues 0 and 1.

To configure wrr-queue group 2 applying a percent value of 25 to queues 0 and 1 for scheduler-set 1, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos scheduler-set 1 wrr-queue group 2
percent 25 queues 0 1
```

To configure wrr-queue group 2 applying a percent value of 50 to queue 2 for scheduler-set 1, use the commands:

```
awplus# configure terminal
awplus(config)# mls qos scheduler-set 1 wrr-queue group 2
percent 50 queues 2
```

The switch will empty twice as many packets from queue 2 as it will from queues 0 and 1.

Related commands [mls qos scheduler-set priority-queue](#)
[show mls qos scheduler-set](#)

Command changes Version 5.5.5-2.1: **percent** parameter added; more scheduler-sets supported on some products

no police

Overview Use this command to disable any policer previously configured on the class-map.

Syntax no police

Mode Policy Map Class Configuration

Usage notes This command disables any policer previously configured on the class-map.

Example To disable policing on a class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# no police
```

Related commands [police single-rate action](#)
[police twin-rate action](#)

police-aggregate

Overview Use this command to apply a previously created aggregate-policer to the class-map.

Use the **no** variant of this command to remove a previously created aggregate-policer from the class-map.

Syntax police-aggregate <name>
no police-aggregate <name>

Parameter	Description
<name>	Specify a aggregate policer name.

Mode Policy Map Class Configuration

Usage This command enables you to apply an aggregate policer to a number of different class- maps, and meter them as one group. Note that you cannot apply this command to any class-map that already has a policer assigned by using the **police single (or twin) rate exceed action** command.

Examples To apply aggregate policer ap1 to a class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# police-aggregate ap1
```

To remove a previously created aggregate-policer from the class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# no police-aggregate ap1
```

police counters

Overview Use this command to enable policer counters for a class-map. This command can be used separately or in conjunction with a traffic meter (single or twin-rate meters).

Use the **no** variant of this command to disable policer counters for a class-map.

Syntax police counters
no police counters

Default Policer counters are disabled by default.

Mode Policy Map Class Configuration

Usage notes This command only allows counting of traffic forwarded in hardware. Traffic that is dropped or trapped to the CPU does not increment the counter, unless it is also forwarded in hardware.

Example To enable policer counters for a class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# police counters
```

To disable policer counters for a class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# no police counters
```

Related commands

- mls qos aggregate-police counters**
- police single-rate action**
- police twin-rate action**
- show mls qos interface policer-counters**
- storm-protection**

police single-rate action

Overview Configures a single-rate policer for a class-map.

Syntax `police single-rate <cir> <cbs> <ebs> action {drop-red|transmit}`

Parameter	Description
<cir>	Specify the Committed Information Rate (CIR) (1-100000000 kbps).
<cbs>	Specify the Committed Burst Size (CBS) (0-16777216 bytes).
<ebs>	Specify a Excess Burst Size (EBS) (0-16777216 bytes).
action	Specify the action if the rate is exceeded.
drop-red	Drop the red packets.
transmit	Packets are sent without modification.

Mode Policy Map Class Configuration

Usage notes You can use a policer to meter the traffic classified by the class-map and assign it to one of three bandwidth classes.

The bandwidth classes are green (conforming), yellow (partially-conforming), and red (non-conforming). A single-rate policer is based on three values. These are the average rate, minimum burst and maximum burst.

Color	Definition
green	The traffic rate is less than the average rate and minimum burst.
yellow	The traffic rate is between the minimum burst and the maximum burst.
red	The traffic rate exceeds the average rate and the maximum burst.

Using an action of drop-red means that any packets classed as red are discarded.

NOTE:

This command will not take effect when applied to a class-map that attaches to a channel group whose ports span processor instances.

Example To configure a single rate meter measuring traffic of 100 Mbps that drops a sustained burst of traffic over this rate, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# police single-rate 100000 1875000 1875000
action drop-red
```

Related commands **no police**
police twin-rate action

police twin-rate action

Overview Configures a twin-rate policer for a class-map.

Syntax `police twin-rate <cir> <pir> <cbs> <pbs> action {drop-red|transmit}`

Parameter	Description
<cir>	Specify the Committed Information Rate (CIR) (1-100000000 kbps).
<pir>	Specify the Peak Information Rate (PIR) (1-100000000 kbps).
<cbs>	Specify the Committed Burst Size (CBS) (0-16777216 bytes).
<pbs>	Specify the Peak Burst Size (PBS) (0-16777216 bytes).
action	Specify the action if rate is exceeded.
drop-red	Drop the red packets.
transmit	Transmit packets.

Mode Policy Map Class Configuration

Usage notes A policer can be used to meter the traffic classified by the class-map and as a result will be given one of three bandwidth classes. These are green (conforming), yellow (partially-conforming), and red (non-conforming).

A twin-rate policer is based on four values. These are the minimum rate (CIR), minimum burst size (CBS), maximum rate (PIR), and maximum burst size (PBS). The following table shows how these values define the bandwidth classes.

Bandwidth Class	Definition
green	The sum of the number of existing (buffered) bytes plus those arriving at the port per unit time results in a value that is less than that set for the CBS.
yellow	The sum of the number of existing (buffered) bytes plus those arriving at the port per unit time results in a value that is between those set for the CBS and the PBS.
red	The sum of the number of existing (buffered) bytes plus those arriving at the port per unit time results in a value that exceeds that set for the PBS.

Using an action of drop-red means that any packets classed as red will be discarded.

Example To configure a twin rate meter measuring a minimum rate of 10 Mbps and a maximum rate of 20 Mbps, and drop red packets, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map name
awplus(config-pmap)# class classname
awplus(config-pmap-c)# police twin-rate 10000 20000 1875000
3750000 action drop-red
```

Related commands [no police](#)
[police single-rate action](#)

policy-map

Overview Use this command to create a policy-map and to enter Policy Map Configuration mode to configure the specified policy-map.
Use the **no** variant of this command to delete an existing policy-map.

Syntax policy-map <name>
no policy-map <name>

Parameter	Description
<name>	Name of the policy-map.

Mode Global Configuration

Example To create a policy-map called pmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)#
```

Related commands [class-map](#)

service-policy input

Overview Use this command to apply a policy-map to the input of an interface.
Use the **no** variant of this command to remove a policy-map and interface association.

Syntax service-policy input <policy-map>
no service-policy input <policy-map>

Parameter	Description
<policy-map>	Policy map name that will be applied to the input.

Mode Interface Configuration

Usage notes This command can be applied to switch ports or static channel groups, but not to dynamic (LACP) channel groups.

Example To apply a policy-map named pmap1 to interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
wplus(config-if)# service-policy input pmap1
```

set bandwidth-class

Overview Use this command to set a bandwidth-class color to assign to classified traffic. The color represents the traffic's conformance to the policer's allocated bandwidth. Green traffic is assumed to be conforming, yellow is semi-conforming, and red is non-conforming.

Use the **no** variant of this command to turn off a bandwidth-class color assigned to classified traffic.

Syntax `set bandwidth-class {green|yellow|red}`
`no set bandwidth-class {green|yellow|red}`

Parameter	Description
green	Mark the packet as green.
yellow	Mark the packet as yellow.
red	Mark the packet as red.

Mode Policy Map Class Configuration

Usage notes There is a limit to the number of unique combinations of CoS, DSCP, queue, and bandwidth-class color values that can be assigned to classified traffic. Each unique combination of values is referred to as a QoS profile.

This **set bandwidth-class** command is one way to set the packets' bandwidth class. The premark-dscp map is an alternative way to do this. Both methods work by assigning a QoS profile to traffic that matches the policy-map.

As well as bandwidth class, there are also commands to explicitly set CoS, DSCP and queue values for packets that match a class-map inside a policy-map. The other commands are:

- **set cos**
- **set dscp**
- **set queue**

Do not use a mixture of the **set** commands and the premark-dscp map.

This is because using any one (or more) of the **set** commands overrides the premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Examples To set the bandwidth class for all traffic classified by this class-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# set bandwidth-class green
```

Note that the class-map and policy-map should already have been created by using the **class-map** and the **policy-map**.

To stop setting packets green for the policy pmap1 and the class cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# no set bandwidth-class green
```

Related **class-map**
commands **set cos**
set dscp
set queue
trust dscp

set cos

Overview Use this command to set a CoS value to assign to classified traffic.

Use the **no** variant of this command to turn off the CoS value assigned to classified traffic.

Syntax set cos <0-7>
no set cos

Parameter	Description
<0-7>	The new CoS value to be assigned.

Mode Policy Map Class Configuration

Usage notes There is a limit to the number of unique combinations of CoS, DSCP, queue, and bandwidth-class color values that can be assigned to classified traffic. Each unique combination of values is referred to as a QoS profile.

This **set cos** command is one way to set the packets' CoS. The premark-dscp map is an alternative way to do this. Both methods work by assigning a QoS profile to traffic that matches the policy-map.

As well as CoS, there are also commands to explicitly set bandwidth class, DSCP and queue values for packets that match a class-map inside a policy-map. The other commands are:

- **set bandwidth-class**
- **set dscp**
- **set queue**

Do not use a mixture of the **set** commands and the premark-dscp map.

This is because using any one (or more) of the **set** commands overrides the premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Examples To set the CoS value to 7 for all traffic classified by the selected class-map and policy-map, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# set cos 7
```

To turn off the above setting, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# no set cos
```

Related commands

- set bandwidth-class**
- set dscp**
- set queue**
- set dscp**

set dscp

Overview For a specific class-map and policy-map this command will assign or change the DSCP value within the packet. Note that where more than one class-map has been assigned to a particular DSCP, the switch will apply the action of the class-map that was created first.

The **no** variant of this command will negate the DSCP value specified with the **set dscp** command.

Syntax set dscp <0-63>
no set dscp

Parameter	Description
<0-63>	The new DSCP value. A value between 0 and 63.

Mode Policy Map Class Configuration

Usage notes There is a limit to the number of unique combinations of CoS, DSCP, queue, and bandwidth-class color values that can be assigned to classified traffic. Each unique combination of values is referred to as a QoS profile.

This **set dscp** command is one way to set the packets' DSCP. The premark-dscp map is an alternative way to do this. Both methods work by assigning a QoS profile to traffic that matches the policy-map.

As well as DSCP, there are also commands to explicitly set bandwidth class, CoS and queue values for packets that match a class-map inside a policy-map. The other commands are:

- **set bandwidth-class**
- **set cos**
- **set queue**

Do not use a mixture of the **set** commands and the premark-dscp map.

This is because using any one (or more) of the **set** commands overrides the premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Example To set a DSCP value of 35 to all traffic classified by a class-map of cmap1 and a policy-map of pmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# set dscp 35
```

Related commands

- set bandwidth-class**
- set cos**
- set queue**
- trust dscp**

set ip next-hop (PBR)

Overview Use this command to configure policy-based routing. When this command is set, all packets that match a selected class-map will be forwarded to the specified next hop.

The **no** variant of this command removes the next-hop address (in the context of its policy-map and class-map) from the configuration.

Syntax `set ip next-hop <ip-addr>`
`no set ip next-hop`

Parameter	Description
<ip-addr>	The IP address of the next hop destination.

Mode Policy Map Class Configuration

Usage notes **Combining conventional and policy-based routing**

In typical deployments of policy-based routing, some traffic types require conventional routing (i.e. via the routes in the IP routing table) while other traffic types require policy-based routing.

Where the traffic to be policy-routed is a subset of the traffic that is to be conventionally routed, then the configuration is reasonably simple. To configure this, make a policy-map that contains one or more class-maps that match the traffic to be policy routed. Then configure their next-hop with this command (**set ip next-hop**). The remaining traffic will be conventionally routed according to the rules set for the default class-map, providing that this is not subject to the **set ip next-hop**.

The situation becomes more complex if the traffic requiring conventional routing is a subset of the traffic to be policy-routed. To configure this, make a policy-map that contains one, or more, class-maps that match the requirement for conventional routing. Do not configure these class-maps with a **set ip next-hop** command. Then identify the remaining class-maps that require policy-based routing and apply the **set ip next-hop** command to them. Note that this remaining traffic could be just the default class-map, if all other traffic types were to be policy-routed.

Also note that the order in which the class-maps are configured in the policy-map is important, because traffic is matched against the class-maps in the order that they were assigned to the policy-map.

For more information about PBR, see the [Policy-Based Routing Feature Overview and Configuration Guide](#).

Example To forward packets to 192.168.1.1 if they match the class-map called cmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# set ip next-hop 192.168.1.1
```

Related commands [class-map](#)

set queue

Overview Use this command to set a queue value to assign to classified traffic. This will override the default queue as configured by the **mls qos queue** command, but may be overridden by subsequent QoS mechanisms (such as remarking).

Use the **no** variant of this command to negate the queue value assigned to classified traffic by the **set queue** command.

Syntax set queue <0-7>
no set queue

Parameter	Description
<0-7>	Specify a new queue value.

Mode Policy Map Class Configuration

Usage notes There is a limit to the number of unique combinations of CoS, DSCP, queue, and bandwidth-class color values that can be assigned to classified traffic. Each unique combination of values is referred to as a QoS profile.

This **set queue** command is one way to set the packets' queue. The premark-dscp map is an alternative way to do this. Both methods work by assigning a QoS profile to traffic that matches the policy-map.

As well as queue, there are also commands to explicitly set CoS, DSCP and bandwidth class values for packets that match a class-map inside a policy-map. The other commands are:

- **set bandwidth-class**
- **set cos**
- **set dscp**

Do not use a mixture of the **set** commands and the premark-dscp map.

This is because using any one (or more) of the **set** commands overrides the premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Example To set the queue to value 5 for all traffic classified as cmap1 and pmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# set queue 5
```

Related commands

- set bandwidth-class**
- set cos**
- set dscp**
- trust dscp**

show class-map

Overview Use this command to display the QoS class-maps' criteria for classifying traffic.

Syntax show class-map [*<class-map-name>*]

Parameter	Description
<i><class-map-name></i>	Name of the class-map.

Mode User Exec and Privileged Exec

Example To display a QoS class-map's match criteria for classifying traffic, use the command:

```
awplus# show class-map cmap1
```

Output The following shows typical output.

Example output from the show class-map command

```
awplus#show class-map
CLASS-MAP-NAME: myClass
Match Mac Type: 2 l2mcast
CLASS-MAP-NAME: default
```

Related commands [class-map](#)

show mls qos

Overview Use this command to display whether QoS is enabled or disabled on the switch.

Syntax show mls qos

Mode User Exec and Privileged Exec

Example To display whether QoS is enabled or disabled, use the command:
awplus# show mls qos

Output The following shows typical output.

Example output from the show mls qos command

```
awplus#show mls qos
Enable
```

Related commands [mls qos enable](#)

show mls qos aggregate-policer

Overview Displays all or a single aggregate-policer. If no name is specified, all aggregate policers will be displayed.

Syntax show mls qos aggregate-policer [<name>]

Parameter	Description
<name>	Aggregate policer name.

Mode User Exec and Privileged Exec

Example To display all aggregate-policers, use the command:

```
awplus# show mls qos aggregate-policer
```

Output The following shows typical output.

Example output from the show mls qos aggregate-policer command

```
AGGREGATE-POLICER-NAME: ap1
Policer single-rate action drop-red:
average rate(1 kbps) minimum burst(2 B) maximum burst(3 B)
AGGREGATE-POLICER-NAME: ap2
Policer twin-rate action drop-red policed-dscp-tx:
minimum rate(1 kbps) maximum rate(2 kbps) minimum burst(3 B)
maximum burst(4 B)
```

Related commands [mls qos aggregate-police action](#)
[police-aggregate](#)

show mls qos interface

Overview Displays the current settings for the interface. This includes its default CoS and queue, scheduling used for each queue, and any policies/maps that are attached.

Syntax show mls qos interface [*<port>*]

Parameter	Description
<i><port></i>	Switch port.

Mode User Exec and Privileged Exec

Example To display current CoS and queue settings for interface port1.0.1, use the command:

```
awplus# show mls qos interface port1.0.1
```

Output The following shows typical output.

Example output from the show mls qos interface command for port1.0.1

```
awplus#show mls qos interface port1.0.1
Interface: port1.0.1

Scheduler-set: None
Number of egress queues: 8

Egress Queue:      0
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      1
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      2
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      3
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      4
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      5
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      6
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb

Egress Queue:      7
Status:            Enabled
Queue Limit:       12%
Egress Rate Limit: 0 Kb
Trust Mode: Ports default priority
Port Default Priority: 0
VLAN Priority Override: Not Configured
Egress Traffic Shaping Overhead: 20
Egress Traffic Shaping: Not Configured
The number of COS Values mapped: 8
Cos (Queue): 0(0), 1(0), 2(0), 3(0), 4(0), 5(0), 6(0), 7(0)
```

Parameters in the output of the show mls qos interface command

Parameter	Description
Scheduler-set	The number of the scheduler set that is applied to this interface. The scheduler set determines which queues are emptied using a weighted round robin

Parameter	Description
	algorithm instead of being emptied in strict priority order.
Number of egress queues	The total number of egress queues available on this interface.
Egress Queue	Number of this egress queue.
Status	Queue can either be enabled or disabled.
Queue Limit	The percentage of the port's buffers that have been allocated to this queue.
Egress Rate Limit	The amount of traffic that can be transmitted via this queue per second. 0 Kb means there is currently no rate-limiting enabled.
Egress Traffic Shaping Overhead	The number of bytes specified to allow for the size of packet preamble and inter-packet gap (the "overhead") in egress queue rate limiting. Use the egress-rate-limit overhead command to change this.

Related commands **mls qos queue**
mls qos scheduler-set
wrr-queue queue-limit

Command changes Version 5.5.1-0.1: DSCP queue mapping removed from output

show mls qos interface policer-counters

Overview This command displays an interface's policer counters. This can either be for a specific class-map or for all class-maps attached to the interface. If no class-map is specified then all class-map policer counters attached to the interface are displayed.

Syntax `show mls qos interface <port> policer-counters [class-map <class-map>]`

Parameter	Description
<port>	Switch port.
class-map	Select a class-map.
<class-map>	Class-map name.

Mode User Exec and Privileged Exec

Usage Note that:

- You must also turn on policer counters, by entering the **police counters** command.
- The counters are based on metering performed on the specified class-map. Therefore, the 'Dropped Bytes' counter is the number of bytes dropped due to metering. This is different from packets dropped via a 'deny' action in the ACL. If a policer is configured to perform re-marking, bytes can be marked Red but are not dropped, and is shown with a value of 0 for the Dropped field and a non-0 value for the 'Red Bytes' field.

Example To show the counters for all class-maps attached to port1.0.1, use the command:

```
awplus# show mls qos interface port1.0.1 policer-counters
```

Output The following shows typical output.

Example output from show mls qos interface policer-counters on a port

```
awplus#show mls qos interface port1.0.1 policer-counters
Interface:                port1.0.1
Class-map:                cmap1
  Green Bytes:            217
  Yellow Bytes:           0
  Red Bytes:              0
  Dropped Bytes:          0
  Non-dropped Bytes:      217
```

Related commands

- [mls qos queue](#)
- [police counters](#)
- [wrr-queue queue-limit](#)

show mls qos interface queue-counters

Overview This command displays an interface's egress queue counters. This can either be for a specific queue or for all queues on the interface. If no queue is specified all queue counters on the interface will be displayed.

The counters show the number of frames currently in the queue and the maximum number of frames allowed in the queue, for individual egress queues and the port's queue (which will be a sum of all egress queues).

Syntax `show mls qos interface <port> queue-counters [queue <0-7>]`

Parameter	Description
<port>	The switch port to display counters for.
queue <0-7>	The number of the queue to display counters for.

Mode User Exec and Privileged Exec

Example To show the counters for all queues on port1.0.1, use the command:
`awplus# show mls qos interface port1.0.1 queue-counters`

Output The following shows typical output.

Example output from show mls qos interface queue-counters

```
awplus#show mls qos interface port1.0.1 queue-counters
Interface port1.0.1 Queue Counters:
  Port queue length      12(maximum 844)
  Egress Queue length:
    Queue 0              0 (maximum 18)
    Queue 1              0 (maximum 18)
    Queue 2              12(maximum 18)
    Queue 3              0 (maximum 18)
    Queue 4              0 (maximum 18)
    Queue 5              0 (maximum 18)
    Queue 6              0 (maximum 18)
    Queue 7              0 (maximum 18)

  Egress queue drop/transmit counters:
    Queue 0              0          0          0          0
    Queue 1              0          0          0          0
    Queue 2              0          0          0          0
    Queue 3              0          0          0          0
    Queue 4              0          0          576          9
    Queue 5              0          0          0          0
    Queue 6              0          0      10489664      63901
    Queue 7              0          0          0          0
```

Parameters in the output from show mls qos interface queue-counters

Parameter	Description
Interface	Port we are showing the counters for.
Port queue length	Number of frames in the port's queue. This will be the sum of all egress queues on the port.
Egress Queue length	Number of frames in a specific egress queue.
Egress queue drop/transmit counters	The number of bytes and packets dropped and transmitted on each egress queue.

Related commands [clear mls qos interface queue-counters](#)
[wrr-queue queue-limit](#)

show mls qos interface storm-status

Overview Show the current configuration and status of the QoS Storm Protection (QSP) on the given port.

Note that before you can enable storm protection, you must first enable policer counters. To do this, enter the **police counters** command in **config-pmap-c** mode.

Syntax show mls qos interface <port> storm-status

Parameter	Description
<port>	Switch port.

Mode User Exec and Privileged Exec

Example To see the QSP status on port1.0.1, use the command:
awplus# show mls qos interface port1.0.1 storm-status

Output The following shows typical output.

Example output from show mls qos interface storm-status

Interface:	port1.0.1
Storm-Protection:	Enabled
Port-status:	Enabled
Storm Action:	vlandisable
Storm Window:	5000 ms
Storm Downtime:	0 s
Timeout Remaining:	0 s
Last read data-rate:	0 kbps
Storm Rate:	1000 kbps

Related commands

- [storm-action](#)
- [storm-downtime](#)
- [storm-protection](#)
- [storm-rate](#)
- [storm-window](#)

show mls qos maps cos-queue

Overview Show the current configuration of the cos-queue map.

Syntax show mls qos maps cos-queue

Mode User Exec and Privileged Exec

Example To display the current configuration of the cos-queue map, use the command:

```
awplus# show mls qos maps cos-queue
```

Output The following shows typical output.

Example output from show mls qos maps cos-queue

COS-TO-QUEUE-MAP:									
COS :	0	1	2	3	4	5	6	7	

QUEUE:	2	0	1	3	4	5	6	7	

Related commands [mls qos map cos-queue](#)

show mls qos maps premark-dscp

Overview This command displays the premark-dscp map. This map is used to replace the DSCP, CoS, queue and/or bandwidth class of a packet matching the class-map, based on a lookup DSCP value.

Syntax show mls qos maps premark-dscp [<0-63>]

Parameter	Description
<0-63>	DSCP table entry.

Mode User Exec and Privileged Exec

Example To display the premark-dscp map for DSCP 1, use the command:

```
awplus# show mls qos maps premark-dscp 1
```

Output The following shows typical output.

Example output from the show mls qos maps premark-dscp command

PREMARK-DSCP-MAP:				
DSCP 1				
Bandwidth Class	Green	Yellow	Red	

New DSCP	1	-	-	
New CoS	0	-	-	
New Queue	5	-	-	
New Bandwidth Class	green	-	-	
...				

Related commands [mls qos map premark-dscp](#)
[trust dscp](#)

show mls qos scheduler-set

Overview Use this command to display the scheduler-set configuration.

Syntax show mls qos scheduler-set

Mode Privileged Exec

Example To display the scheduler-set configuration, use the command:

```
awplus# show mls qos scheduler-set
```

Output The following shows typical output.

Example output from the show mls qos scheduler-set command when configured with the weight parameter

```
awplus(config)#show mls qos scheduler-set
Key: SP = Strict Priority
      WRR1 = Weighted Round Robin arbitration group 1
      WRR2 = Weighted Round Robin arbitration group 2

egress queue:          0      1      2      3      4      5      6      7

Scheduler-set 1 algorithm: WRR1  WRR1  WRR1  WRR1  WRR1  WRR1  SP      SP
                        WRR weight: 25   25   25   25   25   25

Scheduler-set 2 algorithm: WRR1  WRR1  WRR1  WRR1  SP      SP      SP      SP
                        WRR weight: 10   20   30   50

Scheduler-set 3...
```

Example output from the show mls qos scheduler-set command when configured with the percent parameter

```
awplus(config)#show mls qos scheduler-set
Key: SP = Strict Priority
      WRR1 = Weighted Round Robin arbitration group 1
      WRR2 = Weighted Round Robin arbitration group 2

egress queue:          0      1      2      3      4      5      6      7

Scheduler-set 1 algorithm: SP      SP      SP      SP      SP      SP      SP      SP
                        WRR weight:

Scheduler-set 2 algorithm: WRR2  WRR2  WRR1  WRR1  WRR1  SP      SP      SP
                        WRR weight: 50%  50%  50%  25%  25%

Scheduler-set 3...
```

Example output from the show mls qos scheduler-set command showing warning messages when incorrectly configured with the percent parameter

```
awplus(config)#show mls qos scheduler-set
Key: SP = Strict Priority
      WRR1 = Weighted Round Robin arbitration group 1
      WRR2 = Weighted Round Robin arbitration group 2

egress queue:          0      1      2      3      4      5      6      7

Scheduler-set 1 algorithm: SP      SP      WRR1  WRR1  SP      WRR2  SP      SP
                        WRR weight:          30%  30          50%

Scheduler-set 2 algorithm: SP      SP      SP      SP      SP      WRR1  WRR1  SP
                        WRR weight:          80%  80%

Scheduler-set 3...
...
% Warning: Scheduler-set 1 WRR1: unsupported combination of weight and percent.
% Warning: Scheduler-set 1 WRR1: total allocation of 30% is less than 100%.
% Warning: Scheduler-set 1 WRR2: total allocation of 50% is less than 100%.
% Warning: Scheduler-set 2 WRR1: total allocation of 160% exceeds 100%.
```

Related commands [mls qos scheduler-set priority-queue](#)
[mls qos scheduler-set wrr-queue group](#)

Command changes Version 5.5.5-2.1: additional show output for new parameters

show platform classifier statistics utilization brief

Overview This command displays the number of used entries available for various platform functions, and the percentage that number of entries represents of the total available.

Syntax show platform classifier statistics utilization brief

Mode Privileged Exec

Example To display the platform classifier utilization statistics, use the following command:

```
awplus# show platform classifier statistics utilization brief
```


Output The following shows typical output.

```
awplus#show platform classifier statistics utilization brief
[Instance 0]
```

```
[port1.0.1-port1.0.10]
Usage:
```

```

                Used / Total
-----
System          0
MLD Snooping    0
DHCP Snooping   0
Loop Detection  0
EPSR            0
CFM            0
G8032          0
Global ACL      0
ACL            0
VACL          0
QoS            0
RA Guard       0
BFD           0
AMFAPPS        0
Openflow Hybrid 0
Openflow Flow  0
Openflow Default 0
Pre-Ingress    0
```

```
Egress:
VLAN Xlate      0
VLAN Isolate    0
VLAN IsolateDef 0
Total          0 / 1536 (0.00%)
```

```
Qos Rule Limit Reached (clear on read): 0
Total Qos Rule Limit Reached from startup: 0
```

```
Pre-Ingress Rule Limit Reached (clear on read): 0
Total Pre-Ingress Rule Limit Reached from startup: 0
```

```
Egress Rule Limit Reached (clear on read): 0
Total Egress Rule Limit Reached from startup: 0
```

```

UDB Usage:
Legend of Offset Type) 1:Ether 2:IP 3:TCP/UDP
UDB Set      Offset Type      Used / Total
-----
0-----8-----15-----
IPv4 TCP      0000000      0 / 6
IPv4 UDP      0000000      0 / 6
MPLS          0000000      0 / 6
IPv4 Frag     0000000      0 / 6
IPv4          0000000      0 / 6
Ethernet      0000000      0 / 6
User-Def      0000000      0 / 6
IPv6 L2       0000000      0 / 6
```

Index	User	Shared	DSCP	Queue	CoS	Bandwidth-class	RefCount	StaticCnt
0	Cos 2 queue	No	0	2	0	Green	1	1
1	Cos 2 queue	No	0	0	1	Green	1	1
2	Cos 2 queue	No	0	1	2	Green	1	1
3	Cos 2 queue	No	0	3	3	Green	1	1
4	Cos 2 queue	No	0	4	4	Green	1	1
5	Cos 2 queue	No	0	5	5	Green	1	1
6	Cos 2 queue	No	0	6	6	Green	1	1

QOS AND POLICY-BASED ROUTING COMMANDS
SHOW PLATFORM CLASSIFIER STATISTICS UTILIZATION BRIEF

7	Cos 2 queue	No	0	7	7	Green	1	1
8	DSCP Premark	No	0	0	0	Green	1	1
9	DSCP Premark	No	1	0	0	Green	1	1
...								
71	DSCP Premark	No	63	0	0	Green	1	1
72	CPU Egress	Yes	0	0	0	Green	1	1
73	CPU Egress	Yes	0	1	1	Green	1	1
74	CPU Egress	Yes	0	2	2	Green	1	1
75	CPU Egress	Yes	0	3	3	Green	1	1
...								

**Output
parameters**

Depending on your switch, you will see some of the following parameters in the output from **show platform classifier statistics utilization brief**

Parameter	Description
IPv6 Multicast	Reserved hardware space for use by IPv6 multicast, when the ipv6 multicast-routing command is used.
System	Fixed system entries. For example, resiliency links make use of system ACLs.
MLD Snooping	Entries to send various packets that MLD Snooping is interested in to the CPU.
DHCP Snooping	Entries used to send DHCP and ARP packets to the CPU. User-added DHCP Snooping filters under ACLs are counted under the ACL or QoS categories.
Loop Detection	Entries uses to send the special loop detection frame to the CPU.
EPSR	Entries used to send EPSR control traffic to the CPU.
CFM	Entries used by Connectivity Fault Management.
G8032	Entries used to send G.8032 control traffic to the CPU.
Global ACLs	Entries for ACLs appear here if the ACLs are applied globally instead of per switchport.
ACL	Entries for ACL filters that have been applied directly to ports using the access-group command.
VACL	Entries for VLAN-based ACLs (ACLs that are applied to VLANs instead of ports).
DOS	Entries used for Denial of Service protection.
UFO	Entries used by Upward Forwarding Only (UFO).
QoS	Entries for ACL filters and other class-map configurations, such as policers, applied through policy maps using the service input command.
RA Guard	Entries used to block IPv6 router advertisements, configured with the ipv6 nd raguard command.
AMFAPPS	Entries used by AMF Application Proxy. These entries enable the SES Controller to block infected ports.
Pre-Ingress	Entries used for VLAN ID Translation (and also for subnet-based and MAC-based VLAN entries on SBx81XLEM cards).
Egress	Entries used for VLAN ID Translation.
UDB	User Defined Bytes (UDB), which are a limited resource of bytes that can be used to implement additional arbitrary matching on packet bytes on some switches. The software manages the use and allocation of these

Parameter	Description
	bytes automatically. The output of this table is intended for use by Allied Telesis Customer Support only.

Related commands **show platform**
ipv6 access-list (named IPv6 hardware ACL)

show policy-map

Overview Displays the policy-maps configured on the switch. The output also shows whether or not they are connected to a port (attached / detached) and shows their associated class-maps.

Syntax show policy-map [<name>]

Parameter	Description
<name>	The name of a specific policy-map.

Mode User Exec and Privileged Exec

Example To display a listing of the policy-maps configured on the switch, use the command:

```
awplus# show policy-map
```

Output The following shows typical output.

Example output from the show policy-map command

```
POLICY-MAP-NAME: example
  Interfaces:
    Default class-map action: permit

  CLASS-MAP-NAME: default
    Policer counters enabled
```

Related commands [no police](#)
[service-policy input](#)

storm-action

Overview Sets the action to be taken when triggered by QoS Storm Protection (QSP). There are three available options:

- **portdisable** will disable the port in software.
- **vlandisable** will disable the port from the VLAN matched by the class-map in class-map. This option requires the match vlan class-map to be present in the class-map
- **linkdown** will physically bring the port down. .

The **no** variant of this command will negate the action set by the **storm-action** command.

Syntax storm-action {portdisable|vlandisable|linkdown}
no storm-action

Parameter	Description
portdisable	Disable the port in software.
vlandisable	Disable the VLAN.
linkdown	Shutdown the port physically.

Mode Policy Map Class Configuration

Examples To apply the storm protection of **vlandisable** to the policy-map named "pmap2" and the class-map named "cmap1", use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap1
awplus(config-pmap-c# storm-action vlandisable
```

To negate the storm protection set on the policy-map named "pmap2" and the class-map named "cmap1", use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap1
awplus(config-pmap-c# no storm-action
```

Related **storm-downtime**
commands **storm-protection**
storm-rate
storm-window

storm-downtime

Overview Sets the time to re-enable a port that has been disabled by QoS Storm Protection (QSP). The time is given in seconds, from a minimum of one second to maximum of 86400 seconds (i.e. one day).

The **no** variant of this command resets the time to the default value of 10 seconds.

Syntax storm-downtime <1-86400>
no storm-downtime

Parameter	Description
<1-86400>	Seconds.

Default 10 seconds

Mode Policy Map Class Configuration

Examples To re-enable the port in 1 minute, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# storm-downtime 60
```

To re-set the port to the default (10 seconds), use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap1
awplus(config-pmap-c)# no storm-downtime
```

Related commands [storm-action](#)
[storm-protection](#)
[storm-rate](#)
[storm-window](#)

storm-protection

Overview Use this command to enable policy-based Storm Protection (such as QSP - QoS Storm Protection). Storm protection is activated on a port after port state decisions have been made. However, it will only be functional after **storm-rate** and **storm-window** have been set.

The **no** variant of this command disables policy-based Storm Protection.

Syntax storm-protection
no storm-protection

Default By default, storm protection is disabled.

Mode Policy Map Class Configuration

Usage notes

Examples To enable QSP on cmap2 in pmap2, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# police counters
awplus(config-pmap-c)# storm-protection
```

To disable QSP on cmap2 in pmap2, use the following commands:

```
awplus# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# no storm-protection
```

Related commands **police counters**
show mls qos interface storm-status
storm-action
storm-downtime
storm-rate
storm-window

storm-rate

Overview Sets the data rate that triggers the storm-action. The rate is in kbps and the range is from 1kbps to 40Gbps.

Note that this setting is made in conjunction with the **storm-window** command.

Use the **no** variant of this command to negate the **storm-rate** command.

Syntax storm-rate <1-40000000>
no storm-rate

Parameter	Description
<1-40000000>	The range of the storm-rate.

Default No default

Mode Policy Map Class Configuration

Usage This setting is made in conjunction with the **storm-window**.

Examples To limit the data rate to 100Mbps, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# storm-rate 100000
```

To negate the limit set previously, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# no storm-rate
```

Related commands **storm-action**
storm-downtime
storm-protection
storm-window

storm-window

Overview Sets the window size of QoS Storm Protection (QSP). This sets the time to poll the data-rate every given milliseconds. Minimum window size is 100 ms and the maximum size is 60 sec.

Use the **no** variant of this command to negate the **storm-window** command.

Syntax storm-window <100-60000>
no storm-window

Parameter	Description
<100-60000>	The window size, measured in milliseconds.

Default No default

Mode Policy Map Class Configuration

Usage This command should be set in conjunction with the **storm-rate**.

Examples To set the QSP window size to 5000 ms, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# storm-window 5000
```

To negate the QSP window size set previously, use the following commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap2
awplus(config-pmap)# class cmap2
awplus(config-pmap-c)# no storm-window
```

Related commands **storm-action**
storm-downtime
storm-protection
storm-rate

strict-priority-queue egress-rate-limit queues

Overview Sets a limit on the amount of traffic that can be transmitted per second from these queues. The default unit is in Kb, but Mb or Gb can also be specified. The minimum is 651 Kb.

This limit applies to WRR queues too. Setting the limit with this command is the same as setting it with [wrr-queue egress-rate-limit queues](#).

Syntax `strict-priority-queue egress-rate-limit <bandwidth> queues [0] [1][2][3][4][5][6][7]`
`no strict-priority-queue egress-rate-limit <bandwidth> queues [0][1][2][3][4][5][6][7]`

Parameter	Description
<bandwidth>	Bandwidth <1-100000000 kbits> (usable units: k, m, g).
[0][2]...[7]	Selects one or more queues numbered 0 to 7.

Mode Interface Configuration

Example To limit the egress rate of queues 0, 1 and 2 on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# strict-priority-queue egress-rate-limit 500M
queues 0 1 2
```

Related commands [show mls qos interface](#)
[wrr-queue egress-rate-limit queues](#)

strict-priority-queue queue-limit

Overview This command is the same as the [wrr-queue queue-limit](#) command.

It sets the percentages of a port's total buffer pool that each queue is allowed to use. This queue limit is applicable no matter what type of scheduling is configured for the specified queues (i.e. WRR or strict priority).

Note that traffic transmitted from the port will be dropped for up to 1 second while the queue limit is being configured. A warning will display and you will be prompted for a confirmation before the new setting is applied.

See [wrr-queue queue-limit](#) for command details.

trust dscp

Overview This command enables the premark-dscp map to replace the DSCP, bandwidth-class, CoS and/or queue of classified traffic based on a lookup DSCP value.

With the **no** variant of this command, no premark-dscp mapping function will be applied for the selected class-map. QoS components of the packet existing either at ingress, or applied by the class-map, will pass unchanged.

Syntax trust dscp
no trust

Mode Policy-Map Configuration

Usage notes Used together, the **trust dscp** command and the premark-dscp map are one way to change packets' DSCP, bandwidth-class, CoS and queue. They act by assigning a QoS profile to traffic that matches the policy-map.

Alternatively, you can set these values explicitly for a class-map inside a policy-map, by using one of the commands:

- **set bandwidth-class**
- **set cos**
- **set dscp**
- **set queue**

Do not use a mixture of the **set** commands and the map.

This is because using any one (or more) of the **set** commands overrides the whole premark-dscp map, because the **set** commands cause the switch to replace the QoS profile. In the replacement profile, values that are not set by a **set** command default to:

- bandwidth-class: green
- CoS: 0
- DSCP: 0
- queue: 0

Examples To enable the premark-dscp map lookup for policy-map pmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# trust dscp
```

To disable the premark-dscp map lookup for policy-map pmap1, use the commands:

```
awplus# configure terminal
awplus(config)# policy-map pmap1
awplus(config-pmap)# no trust
```

Related commands

- mls qos map premark-dscp**
- set bandwidth-class**
- set cos**
- set dscp**
- set queue**

wrr-queue disable queues

Overview Use this command to disable an egress queue from transmitting traffic. The **no** variant of this command enables an egress queue to transmit traffic.

Syntax wrr-queue disable queues [0][1][2][3][4][5][6][7]
no wrr-queue disable queues [0][1][2][3][4][5][6][7]

Parameter	Description
[0][2]...[7]	Selects one or more queues numbered 0 to 7.

Mode Interface Configuration

Examples To disable queue 1 on port1.0.1 from transmitting traffic, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# wrr-queue disable queues 1
```

To enable queue 1 on port1.0.1 to transmit traffic, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no wrr-queue disable queues 1
```

Related commands [show mls qos interface](#)

wrr-queue egress-rate-limit queues

Overview Sets a limit on the amount of traffic that can be transmitted per second from these queues. The default unit is in Kb, but Mb or Gb can also be specified. The minimum is 651 Kb.

This limit applies to strict priority queues too. Setting the limit with this command is the same as setting it with **strict-priority-queue egress-rate-limit queues**.

Syntax `wrr-queue egress-rate-limit <bandwidth> queues [0][1][2][3][4][5][6][7]`
`no wrr-queue egress-rate-limit <bandwidth> queues [0][1][2][3][4][5][6][7]`

Parameter	Description
<bandwidth>	Bandwidth <1-100000000 kbits> (usable units: k, m, g).
[0][2]...[7]	Selects one or more queues numbered 0 to 7.

Mode Interface Configuration

Example To limit the egress rate of queues 0, 1 and 2 on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# wrr-queue egress-rate-limit 500M queues 0 1 2
```

Related commands **show mls qos interface**
strict-priority-queue egress-rate-limit queues

wrr-queue queue-limit

Overview Sets the percentages of a port's total buffer pool that each queue is allowed to use. This queue limit is applicable no matter what type of scheduling is configured for the specified queues (i.e. WRR or strict priority).

This command is the same as the **strict-priority-queue queue-limit** command.

Note that traffic transmitted from the port will be dropped for up to 1 second while the queue limit is being configured. A warning will display and you will be prompted for a confirmation before the new setting is applied.

Syntax `wrr-queue queue-limit <1-100> <1-100> <1-100> <1-100> <1-100> <1-100> <1-100> <1-100>`
`no wrr-queue queue-limit`

Parameter	Description
<1-100>	Queue ratio for Queue 0.
<1-100>	Queue ratio for Queue 1.
<1-100>	Queue ratio for Queue 2.
<1-100>	Queue ratio for Queue 3.
<1-100>	Queue ratio for Queue 4.
<1-100>	Queue ratio for Queue 5.
<1-100>	Queue ratio for Queue 6.
<1-100>	Queue ratio for Queue 7.

Mode Interface Configuration

Usage notes Note that at any time you cannot apply more than five unique sets of ratios across ports. The portion of the port's buffer pool that is assigned to each queue is divided by three, with one third applied to each of the three drop precedence colors, red, green, and yellow.

Where no color metering is applied, the queue limit is effectively reduced to a third of the configured value, because in this situation all traffic is classed as green. For example, if the overall queue size available is 792 frames, and equal portions (12.5% of 792 = 99 frames) are assigned to each queue, then 33 frames are assigned to each of the three drop precedence colors. Where no color metering is applied, all traffic is (by default) defined as green, and so is allocated 33 frames per queue. Tail dropping is then applied when each queue is only one third full.

Note that you cannot use this command at the same time as the **egress-rate-limit** command.

Example To configure a queue-limit of 12% on port1.0.1 to port1.0.4 for each queue, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# wrr-queue queue-limit 12 12 12 12 12 12 12 12
```

Related commands **show mls qos interface queue-counters**

42

802.1X Commands

- Contents**
- **Introduction** on page 2113
 - **dot1x accounting** on page 2114
 - **dot1x authentication** on page 2115
 - **debug dot1x** on page 2116
 - **dot1x control-direction** on page 2118
 - **dot1x eap** on page 2120
 - **dot1x eapol-version** on page 2121
 - **dot1x initialize interface** on page 2122
 - **dot1x initialize supplicant** on page 2124
 - **dot1x keytransmit** on page 2125
 - **dot1x max-auth-fail** on page 2126
 - **dot1x max-reauth-req** on page 2128
 - **dot1x max-req** on page 2130
 - **dot1x port-control** on page 2132
 - **dot1x timeout tx-period** on page 2134
 - **show debugging dot1x** on page 2136
 - **show dot1x** on page 2137
 - **show dot1x diagnostics** on page 2140
 - **show dot1x interface** on page 2142
 - **show dot1x sessionstatistics** on page 2144
 - **show dot1x statistics interface** on page 2145
 - **show dot1x supplicant** on page 2146
 - **show dot1x supplicant interface** on page 2149
 - **undebg dot1x** on page 2151

Introduction

Overview 802.1X is an IEEE standard providing a mechanism for authenticating devices attached to a LAN port or wireless device. Devices wishing to access services behind a port must authenticate themselves before any Ethernet packets are allowed to pass through. The protocol is referred to as 802.1X because it was initially defined in the IEEE standard 802.1X, published in 2001 and revised in 2004 and again as the current 802.1X 2010 standard.

This chapter provides an alphabetical reference of commands used to configure 802.1X port access control. For more information, see the [AAA and Port Authentication_Feature Overview and Configuration Guide](#).

dot1x accounting

Overview This command overrides the **default** RADIUS accounting method for IEEE 802.1X-based authentication on an interface by allowing you to apply a user-defined named method list.

Use the **no** variant of this command to remove the named list from the interface and apply the **default** method list.

Syntax dot1x accounting {default|<list-name>}
no dot1x accounting

Parameter	Description
default	Apply the default accounting method list
<list-name>	Apply the user-defined named list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_acct' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# dot1x accounting vlan10_acct
```

To remove the named list from the vlan10 interface and set the authentication method back to **default**, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no dot1x accounting
```

Related commands [aaa accounting dot1x](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x authentication

Overview This command overrides the **default** 802.1X-based authentication method on an interface by allowing you to apply a user-defined named list.

Use the **no** variant of this command to remove the named list from the interface and apply the **default** method.

Syntax dot1x authentication {default|<list-name>}
no dot1x authentication

Parameter	Description
<i>default</i>	Apply the default authentication method list
<list-name>	Apply the user-defined named list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_auth' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# dot1x authentication vlan10_auth
```

To remove the named list from the vlan10 interface and set the authentication method back to **default**, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no dot1x authentication
```

Related commands [aaa authentication dot1x](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

debug dot1x

Overview Use this command to enable 802.1X IEEE Port-Based Network Access Control troubleshooting functions.

Use the **no** variant of this command to disable this function.

Syntax debug dot1x [all|auth-web|event|nsm|packet|timer]
no debug all dot1x
no debug dot1x [all|auth-web|event|nsm|packet|timer]

Parameter	Description
all	Used with the no variant of this command exclusively; turns off all debugging for 802.1X.
auth-web	Specifies debugging for 802.1X auth-web information.
events	Specifies debugging for 802.1X events.
nsm	Specifies debugging for NSM messages.
packet	Specifies debugging for 802.1X packets.
timer	Specifies debugging for 802.1X timers.

Mode Privileged Exec and Global Configuration

Usage notes This command turns on a mode where trace-level information is output during authentication conversations. Be aware that this is a very verbose output. It is mostly useful to capture this as part of escalating an issue to ATI support.

Examples Use this command without any parameters to turn on normal 802.1X debug information.

```
awplus# debug dot1x
awplus# show debugging dot1x
```

```
802.1X debugging status:
 802.1X events debugging is
 802.1X timer debugging is on
 802.1X packets debugging is on
 802.1X NSM debugging is on
```

Related commands [show debugging dot1x](#)
[undebug dot1x](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x control-direction

Overview This command sets the direction of the filter for the unauthorized interface.

If the optional **in** parameter is specified with this command then packets entering the specified port are discarded. The **in** parameter discards the ingress packets received from the supplicant.

If the optional **both** parameter is specified with this command then packets entering (ingress) and leaving (egress) the specified port are discarded. The **both** parameter discards the packets received from the supplicant and sent to the supplicant.

The **no** variant of this command sets the direction of the filter to **both**. The port will then discard both ingress and egress traffic.

Syntax dot1x control-direction {in|both}
no dot1x control-direction

Parameter	Description
in	Discard received packets from the supplicant (ingress packets).
both	Discard received packets from the supplicant (ingress packets) and transmitted packets to the supplicant (egress packets).

Default The authentication port direction is set to **both** by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the port direction to the default (**both**) for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x control-direction
```

To set the port direction to **in** for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x control-direction in
```

To set the port direction to **in** for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x control-direction in
```

Related commands **auth profile (global)**
show dot1x
show dot1x interface
show auth interface

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x eap

Overview This command selects the transmit mode for the EAP packet. If the authentication feature is not enabled then EAP transmit mode is not enabled. The default setting discards EAP packets.

Syntax `dot1x eap {discard|forward|forward-untagged-vlan|forward-vlan}`

Parameter	Description
discard	Discard.
forward	Forward to all ports on the switch.
forward-untagged-vlan	Forward to ports with the same untagged VLAN.
forward-vlan	Forward to ports with the same VLAN.

Default The transmit mode is set to discard EAP packets by default.

Mode Global Configuration

Examples To set the transmit mode of EAP packet to **forward**, to forward EAP packets to all ports on the switch, use the commands:

```
awplus# configure terminal
awplus(config)# dot1x eap forward
```

To set the transmit mode of EAP packet to **discard**, to discard EAP packets, use the commands:

```
awplus# configure terminal
awplus(config)# dot1x eap discard
```

To set the transmit mode of EAP packet to **forward-untagged-vlan**, to forward EAP packets to ports with the same untagged VLAN, use the commands:

```
awplus# configure terminal
awplus(config)# dot1x eap forward-untagged-vlan
```

To set the transmit mode of EAP packet to **forward-vlan**, to forward EAP packets to ports with the same VLAN, use the commands:

```
awplus# configure terminal
awplus(config)# dot1x eap forward-vlan
```

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x eapol-version

Overview This command sets the EAPOL protocol version for EAP packets when 802.1X port authentication is applied.

Use the **no** variant of this command to set the EAPOL protocol version to 1.

The default EAPOL protocol version is version 1.

Syntax dot1x eapol-version {1|2}
no dot1x eapol-version

Parameter	Description
1|2	EAPOL protocol version 1 or 2.

Default The EAP version for 802.1X authentication is set to 1 by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the EAPOL protocol version to 2 for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x eapol-version 2
```

To set the EAPOL protocol version to the default version (1) for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x eapol-version
```

To set the EAPOL protocol version to 2 for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x eapol-version 2
```

Validation Commands **auth profile (global)**
show dot1x
show dot1x interface

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x initialize interface

Overview This command removes authorization for a specified connected interface. The connection will attempt to re-authorize when the specified port attempts to make use of the network connection.

NOTE: *Reauthentication could be a long time after the use of this command because the reauthorization attempt is not triggered by this command. The attempt is triggered by the first packet from the interface trying to access the network resources.*

Syntax dot1x initialize interface <interface-list>

Parameter	Description
<interface-list>	The interfaces or ports to configure. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list. The specified interfaces must exist.

Mode Privileged Exec

Examples To initialize 802.1X port authentication on the interface port1.0.2, use the command:

```
awplus# dot1x initialize interface port1.0.2
```

To unauthorize switch port1.0.2 and attempt reauthentication on switch port1.0.2, use the command:

```
awplus# dot1x initialize interface port1.0.2
```

To unauthorize all switch ports for a 18-port device and attempt reauthentication, use the command:

```
awplus# dot1x initialize interface port1.0.1-port1.0.18
```

Related commands [dot1x initialize supplicant](#)
[show dot1x](#)
[show dot1x interface](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x initialize supplicant

Overview This command removes authorization for a connected supplicant with the specified MAC address or username. The connection will attempt to re-authorize when the specified supplicant attempts to make use of the network connection.

NOTE: *Reauthentication could be a long time after the use of this command because the reauthorization attempt is not triggered by this command. The attempt is triggered by the first packet from the supplicant trying to access the network resources.*

Syntax dot1x initialize supplicant {<macadd>|username}

Parameter	Description
dot1x	IEEE 802.1X Port-Based Access Control.
initialize	Initialize the port to attempt reauthentication.
supplicant	Specify the supplicant to initialize.
<macadd>	MAC (hardware address of the supplicant.
username	The name of the supplicant entry.

Mode Privileged Exec

Example To initialize the supplicant authentication, use the commands

```
awplus# configure terminal
awplus(config)# dot1x initialize supplicant 0090.99ab.a020
awplus(config)# dot1x initialize supplicant guest
```

Related commands [dot1x initialize interface](#)
[show dot1x](#)
[show dot1x supplicant](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x keytransmit

Overview Use this command to enable key transmission on the interface specified previously in Interface mode.

This command enables key transmission over an Extensible Authentication Protocol (EAP) packet between the authenticator and supplicant.

The **no** variant of this command disables key transmission on the interface specified.

Syntax dot1x keytransmit
no dot1x keytransmit

Default Key transmission for port authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To enable the key transmit feature on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x keytransmit
```

To disable the key transmit feature on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x keytransmit
```

Related commands [show dot1x](#)
[show dot1x interface](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x max-auth-fail

Overview Use this command to configure the maximum number of login attempts for a supplicant (client device) using the **auth-fail vlan** feature, when using 802.1X port authentication on an interface.

The **no** variant of this command resets the maximum login attempts for a supplicant (client device) using the auth-fail vlan feature, to the default configuration of 3 login attempts.

Syntax dot1x max-auth-fail <0-10>
no dot1x max-auth-fail

Parameter	Description
<0-10>	Specify the maximum number of login attempts for supplicants on an interface using 802.1X port authentication.

Default The default maximum number of login attempts for a supplicant on an interface using 802.1X port authentication is 3 login attempts.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes This command sets the maximum number of login attempts for supplicants on an interface. The supplicant is moved to the auth-fail VLAN from the Guest VLAN after the number of failed login attempts using 802.1X authentication is equal to the number set with this command.

See the [AAA and Port Authentication Feature Overview and Configuration Guide](#) for information about:

- the auth-fail VLAN feature, and
- restrictions regarding combinations of authentication enhancements working together

Examples To configure the maximum number of login attempts for a supplicant on interface port1.0.2 to a single login attempt, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x max-auth-fail 1
```

To configure the maximum number of login attempts for a supplicant on interface port1.0.2 to the default number of 3 login attempts, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x max-auth-fail
```

To configure the maximum number of login attempts for a supplicant on authentication profile 'student' to a single login attempt, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x max-auth-fail 1
```

Related commands

- auth auth-fail vlan**
- auth profile (global)**
- dot1x max-reauth-req**
- show dot1x interface**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x max-reauth-req

Overview Use this command to set the number of reauthentication attempts before an interface is unauthorized.

The **no** variant of this command resets the reauthentication delay to the default.

Syntax dot1x max-reauth-req <1-10>

no dot1x max-reauth-req

Parameter	Description
<1-10>	Specify the maximum number of reauthentication attempts for supplicants on an interface using 802.1X port authentication.

Default The default maximum reauthentication attempts for interfaces using 802.1X port authentication is two (2) reauthentication attempts, before an interface is unauthorized.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Use this command to set the maximum reauthentication attempts after failure.

Examples To configure the maximum number of reauthentication attempts for interface port1.0.2 to a single (1) reauthentication request, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x max-reauth-req 1
```

To configure the maximum number of reauthentication attempts for interface port1.0.2 to the default maximum number of two (2) reauthentication attempts, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x max-reauth-req
```

To configure the maximum number of reauthentication attempts for authentication profile 'student' to a single (1) reauthentication request, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x max-reauth-req 1
```

Related commands

- auth profile (global)**
- auth supplicant-ip**
- auth supplicant-mac**
- dot1x max-auth-fail**
- dot1x max-req**
- show dot1x interface**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x max-req

Overview Use this command to change the number of times the device resends an EAP Request packet if that packet is lost between the authenticating device and the supplicant. If the supplicant does not respond to an EAP Request after this number of retries, the supplicant fails the authentication process.

Use the **no** variant of this command to return to the default number of retries.

Syntax dot1x max-req <1-10>
no dot1x max-req

Parameter	Description
<1-10>	The number of retries. Note that this does not include the initial attempt, so the total number of attempts is one higher than the number you specify here.

Default The default value is 2.

Note: This means the authenticator sends the original attempt and 2 more attempts, which is 3 attempts in total.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes You can set this on a per-supplicant basis by using the **max-req** parameter in the commands:

- **auth supplicant-ip**
- **auth supplicant-mac**

Example To change the number of retries to 5 for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x max-req 5
```

To return the number of retries to the default setting of 2 for port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x max-req
```

To set the number of retries to 1 for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x max-req 1
```

Related commands

- auth profile (global)**
- auth supplicant-ip**
- auth supplicant-mac**
- dot1x max-reauth-req**
- show dot1x interface**

Command changes Version 5.5.3-1.1: command added

dot1x port-control

Overview This command enables 802.1X port authentication on the interface specified, and sets the control of the authentication port.

The **no** variant of this command disables the port authentication on the interface specified.

Syntax dot1x port-control {force-unauthorized|force-authorized|auto}
no dot1x port-control

Parameter	Description
force-unauthorized	Force the port state to unauthorized. Specify this to force a port to always be in an unauthorized state.
force-authorized	Force the port state to authorized. Specify this to force a port to always be in an authorized state.
auto	Allow the port client to negotiate authentication. Specify this to enable authentication on the port.

Default 802.1X port control is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Use this command to force a port state.

When **port-control** is set to **auto**, the 802.1X authentication feature is executed on the interface, but only if the **aaa authentication dot1x** command has been issued.

If you attempt to change the authentication configuration on an interface that has threat protection quarantine configured, you will see the following error message:

```
% portx.x.x: Application Proxy quarantine configuration must be removed before port authentication is changed
```

Before changing the interface's authentication configuration you must either:

- remove the interface's threat protection configuration, or
- shut down the interface.

Examples To enable port authentication on the interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x port-control auto
```

To enable port authentication force authorized on the interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x port-control force-authorized
```

To disable port authentication on the interface port1.0.2 use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x port-control
```

To enable port authentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x port-control auto
```

Related commands **aaa authentication dot1x**
auth profile (global)
show dot1x interface

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

dot1x timeout tx-period

Overview This command sets the transmit timeout for the authentication request on the specified interface.

The **no** variant of this command resets the transmit timeout period to the default (30 seconds).

Syntax dot1x timeout tx-period <1-65535>
no dot1x timeout tx-period

Parameter	Description
<1-65535>	Seconds.

Default The default transmit period for port authentication is 30 seconds.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Use this command to set the interval between successive attempts to request an ID.

Examples To set the transmit timeout period to 5 seconds on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x timeout tx-period 5
```

To reset transmit timeout period to the default (30 seconds) on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no dot1x timeout tx-period
```

To set the transmit timeout period to 5 seconds on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# dot1x timeout tx-period 5
```

Related commands **auth profile (global)**
show dot1x
show dot1x interface

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show debugging dot1x

Overview Use this command to see what debugging is turned on for 802.1X.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging dot1x

Mode User Exec and Privileged Exec

Example To enable 802.1X debugging and display the debugging option set, use the following commands:

```
awplus# debug dot1x
awplus# show debugging dot1x
```

Example output from the show debugging dot1x command

```
802.1X debugging status:
 802.1X events debugging is on
 802.1X timer debugging is on
 802.1X packets debugging is on
 802.1X NSM debugging is on
```

Related commands [debug dot1x](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x

Overview Use this command to show authentication information for 802.1X port authentication.

If you specify the optional **all** parameter then this command also displays all authentication information for each port available on the switch.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#)**.

Syntax show dot1x [all]

Parameter	Description
all	Displays all authentication information for each port available on the switch.

Mode Privileged Exec

Example awplus# show dot1x all

Example output from the show dot1x all command

```
awplus# show dot1x all
802.1X Port-Based Authentication Enabled
RADIUS server address: 150.87.18.89:1812
Next radius message id: 5
RADIUS client address: not configured
Authentication info for interface port1.0.2
portEnabled: true - portControl: Auto
portStatus: Authorized
reAuthenticate: disabled
reAuthPeriod: 3600

PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
PAE: connectTimeout: 30
BE: suppTimeout: 30 - serverTimeout: 30
CD: adminControlledDirections: in
KT: keyTxEnabled: false
critical: disabled
guestVlan: disabled
dynamicVlanCreation: single-dynamic-vlan
multiVlanSession: disabled
assignFailActionRule: deny
hostMode: multi-supPLICANT
    maxsupPLICANT: 1024

dot1x: enabled
protocolVersion: 1
authMac: enabled
method: PAP
reauthRelearning: disabled
authWeb: enabled
method: PAP
lockCount: 3
packetForwarding: disabled
twoStepAuthentication:
    configured: enabled
    actual: enabled
SupPLICANTMac: none

supPLICANTMac: none
SupPLICANT name: manager
SupPLICANT address: 00d0.59ab.7037
    authenticationMethod: 802.1X Authentication
    portStatus: Authorized - currentId: 1
    abort:F fail:F start:F timeout:F success:T
    PAE: state: Authenticated - portMode: Auto
    PAE: reAuthCount: 0 - rxRespId: 0
    PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30

    BE: state: Idle - reqCount: 0 - idFromServer: 0
    CD: adminControlledDirections: in - operControlledDirections: in
    CD: bridgeDetected: false
    KR: rxKey: false
    KT: keyAvailable: false - keyTxEnabled: false
    criticalState: off
    dynamicVlanId: 2

802.1X statistics for interface port1.0.2
    EAPOL Frames Rx: 5 - EAPOL Frames Tx: 16
    EAPOL Start Frames Rx: 0 - EAPOL Logoff Frames Rx: 0
    EAP Rsp/Id Frames Rx: 3 - EAP Response Frames Rx: 2
    EAP Req/Id Frames Tx: 8 - EAP Request Frames Tx: 2
    Invalid EAPOL Frames Rx: 0 - EAP Length Error Frames Rx: 0
    EAPOL Last Frame Version Rx: 1 - EAPOL Last Frame Src: 00d0.59ab.7037

Authentication session statistics for interface port1.0.2
    session user name: manager
```

```
session authentication method: Remote server
session time: 19440 secs
session terminate cause: Not terminated yet

Authentication Diagnostics for interface port1.0.2
Supplicant address: 00d0.59ab.7037
authEnterConnecting: 2
authEaplogoffWhileConnecting: 1
authEnterAuthenticating: 2
authSuccessWhileAuthenticating: 1
authTimeoutWhileAuthenticating: 1
authFailWhileAuthenticating: 0
authEapstartWhileAuthenticating: 0

authEaplogoggWhileAuthenticating: 0
authReauthsWhileAuthenticated: 0
authEapstartWhileAuthenticated: 0
authEaplogoffWhileAuthenticated: 0
BackendResponses: 2
BackendAccessChallenges: 1
BackendOtherrequestToSupplicant: 3
BackendAuthSuccess: 1
BackendAuthFails: 0
```

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x diagnostics

Overview This command shows 802.1X authentication diagnostics for the specified interface (optional).

If no interface is specified then authentication diagnostics are shown for all interfaces.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show dot1x diagnostics [interface <interface-list>]

Parameter	Description
interface	Specify a port to show.
<interface-list>	The interfaces or ports to configure. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list. The specified interfaces must exist.

Mode Privileged Exec

Example See the sample output below showing 802.1X authentication diagnostics for port1.0.2:

```
awplus# show dot1x diagnostics interface port1.0.2
```


Output The following shows typical output.

Example output from the show dot1x diagnostics command

```
Authentication Diagnostics for interface port1.0.2
  Supplicant address: 00d0.59ab.7037
    authEnterConnecting: 2
    authEaplogoffWhileConnecting: 1
    authEnterAuthenticating: 2
    authSuccessWhileAuthenticating: 1
    authTimeoutWhileAuthenticating: 1
    authFailWhileAuthenticating: 0
    authEapstartWhileAuthenticating: 0
    authEaplogoggWhileAuthenticating: 0
    authReauthsWhileAuthenticated: 0
    authEapstartWhileAuthenticated: 0
    authEaplogoffWhileAuthenticated: 0
  BackendResponses: 2
  BackendAccessChallenges: 1
  BackendOtherrequestToSupplicant: 3
  BackendAuthSuccess: 1
```

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x interface

Overview Use this command to show the status of 802.1X port-based authentication on the specified interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#).

Syntax show dot1x interface *<interface-list>*

Parameter	Description
<i><interface-list></i>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Examples See the sample output below showing 802.1X authentication status for port1.0.2:

```
awplus# show dot1x interface port1.0.2
```

Example output from the show dot1x interface command for a port

```
awplus#show dot1x interface port1.0.2
Authentication info for interface port1.0.2
  portEnabled: true - portControl: Auto
  portStatus: Authorized
  reAuthenticate: disabled
  reAuthPeriod: 3600
  PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
  PAE: connectTimeout: 30
  BE: suppTimeout: 30 - serverTimeout: 30
  CD: adminControlledDirections: in
  KT: keyTxEnabled: false
  critical: disabled
  guestVlan: disabled
  dynamicVlanCreation: single-dynamic-vlan
    assignFailActionRule: deny
  multiVlanSession: disabled
  hostMode: multi-supPLICANT
    maxsupPLICANT: 1024
  dot1x: enabled
  protocolVersion: 1
  authMac: enabled
  method: PAP
  reauthRelearning: disabled
  authWeb: enabled
  method: PAP
  lockCount: 3
  packetForwarding: disabled
    twoStepAuthentication:
      configured: enabled
      actual: enabled
  supPLICANTMac: none
```

Related commands [show auth diagnostics](#)
[show dot1x sessionstatistics](#)
[show dot1x statistics interface](#)
[show dot1x supPLICANT interface](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x sessionstatistics

Overview This command shows authentication session statistics for the specified interface, which may be a static channel (or static aggregator) or a dynamic (or LACP) channel group or a switch port.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show dot1x sessionstatistics [interface <interface-list>]

Parameter	Description
interface	Specify a port to show.
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Example See sample output below showing 802.1X authentication session statistics for port1.0.2:

```
awplus# show dot1x sessionstatistics interface port1.0.2
```

Example output from the show dot1x sessionstatistics command

```
Authentication session statistics for interface port1.0.2
  session user name: manager
  session authentication method: Remote server
  session time: 19440 secs
  session terminat cause: Not terminated yet
```

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x statistics interface

Overview Use this command to show the authentication statistics for the specified interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

The output from this command is the same as the output from the [show auth statistics interface](#) command.

Syntax show dot1x statistics interface <interface-list>

Parameter	Description
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Example To display 802.1X authentication statistics for port1.0.2, use the command:
awplus# show dot1x statistics interface port1.0.2

Output The following shows typical output.

Example output from show dot1x statistics interface for a port

```
awplus# show dot1x statistics interface port1.0.2
802.1X statistics for interface port1.0.2
EAPOL Frames Rx: 5 - EAPOL Frames Tx: 16
EAPOL Start Frames Rx: 0 - EAPOL Logoff Frames Rx: 0
EAP Rsp/Id Frames Rx: 3 - EAP Response Frames Rx: 2
EAP Req/Id Frames Tx: 8 - EAP Request Frames Tx: 2
Invalid EAPOL Frames Rx: 0 - EAP Length Error Frames Rx: 0
EAPOL Last Frame Version Rx: 1 - EAPOL Last Frame
Src:00d0.59ab.7037
```

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x supplicant

Overview This command shows the supplicant state of the authentication mode set for the switch.

This command shows a summary when the optional **brief** parameter is used.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#).

Syntax show dot1x supplicant [<macadd>] [brief]

Parameter	Description
<macadd>	MAC (hardware) address of the Supplicant.
brief	Brief summary of the Supplicant state.

Mode Privileged Exec

Example See sample output below showing the 802.1X authenticated supplicant on the switch:

```
awplus# show dot1x supplicant
```

Example output from the show dot1x supplicant command

```
authenticationMethod: dot1x
totalSupplicantNum: 1
authorizedSupplicantNum: 1
macBasedAuthenticationSupplicantNum: 0
dot1xAuthenticationSupplicantNum: 1
webBasedAuthenticationSupplicantNum: 0
Supplicant name: manager
Supplicant address: 00d0.59ab.7037
  authenticationMethod: dot1x
    Two-Step Authentication:
      firstAuthentication: Pass - Method: mac
      secondAuthentication: Pass - Method: dot1x
portStatus: Authorized - currentId: 4
abort:F fail:F start:F timeout:F success:T
PAE: state: Authenticated - portMode: Auto
PAE: reAuthCount: 0 - rxRespId: 0
PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
BE: state: Idle - reqCount: 0 - idFromServer: 3
BE: suppTimeout: 30 - serverTimeout: 30
CD: adminControlledDirections: in - operControlledDirections: in
CD: bridgeDetected: false
KR: rxKey: false
KT: keyAvailable: false - keyTxEnabled: false
RADIUS server group (auth): radius
RADIUS server (auth): 192.168.1.40
```

See sample output below showing the supplicant on the switch using the **brief** parameter:

```
awplus# show dot1x supplicant 00d0.59ab.7037 brief
```

```
Interface port1.0.2
  authenticationMethod: dot1x
  totalSupplicantNum: 1
  authorizedSupplicantNum: 1
    macBasedAuthenticationSupplicantNum: 0
    dot1xAuthenticationSupplicantNum: 1
    webBasedAuthenticationSupplicantNum: 0
```

Interface	VID	Mode	MAC Address	Status	IP Address	Username
=====	==	==	=====	=====	=====	=====
port1.0.2	2	D	00d0.59ab.7037	Authenticated	192.168.2.201	manager

See sample output below showing the supplicant on the switch using the **brief** parameter:

```
awplus# show dot1x supplicant brief
```

For example, if two-step authentication is configured with 802.1X authentication as the first method and web authentication as the second method then the output is as follows:

```
Interface port1.0.2 authenticationMethod: dot1x/web
  Two-Step Authentication
    firstMethod: dot1x
    secondMethod: web
  totalSupplicantNum: 1
  authorizedSupplicantNum: 1
    macBasedAuthenticationSupplicantNum: 0
    dot1xAuthenticationSupplicantNum: 0
```

webBasedAuthenticationSupplicantNum: 1						
otherAuthenticationSupplicantNum: 0						
Interface	VID	Mode	MAC Address	Status	IP Address	Username
=====	=====	=====	=====	=====	=====	=====
port1.0.2	5	W	0008.0d5e.c216	Authenticated	192.168.1.200	web

Related commands [show dot1x supplicant interface](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show dot1x supplicant interface

Overview Use this command to show the supplicant state of the authentication mode set for the interface.

This command shows a summary when the optional **brief** parameter is used.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#).

Syntax show dot1x supplicant interface *<interface-list>* [brief]

Parameter	Description
<i><interface-list></i>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.
brief	Brief summary of the Supplicant state.

Mode Privileged Exec

Examples See sample output below showing the supplicant on the interface port1.0.2:

```
awplus# show dot1x supplicant interface port1.0.2
```

Example output from the show dot1x supplicant interface command

```
Interface port1.0.2
authenticationMethod: dot1x
totalSupplicantNum: 1
authorizedSupplicantNum: 1
  macBasedAuthenticationSupplicantNum: 0
  dot1xAuthenticationSupplicantNum: 1
  webBasedAuthenticationSupplicantNum: 0
  otherAuthenticationSupplicantNum: 0

Supplicant name: VCSPCVLAN10
Supplicant address: 0000.cd07.7b60
  authenticationMethod: 802.1X
Two-Step Authentication:
  firstAuthentication: Pass - Method: mac
  secondAuthentication: Pass - Method: dot1x
portStatus: Authorized - currentId: 3
abort:F fail:F start:F timeout:F success:T
PAE: state: Authenticated - portMode: Auto
PAE: reAuthCount: 0 - rxRespId: 0
PAE: quietPeriod: 60 - maxReauthReq: 2
BE: state: Idle - reqCount: 0 - idFromServer: 2
CD: adminControlledDirections:in -
operControlledDirections:in
CD: bridgeDetected: false
KR: rxKey: false
KT: keyAvailable: false - keyTxEnabled: false
```

See sample output below showing the supplicant on the switch using the **brief** parameter:

```
awplus# show dot1x supplicant interface port1.0.2 brief
```

```
Interface port1.0.2
authenticationMethod: dot1x
Two-Step Authentication:
  firstMethod: mac
  secondMethod: dot1x
totalSupplicantNum: 1
authorizedSupplicantNum: 1
macBasedAuthenticationSupplicantNum: 0
dot1xAuthenticationSupplicantNum: 1
webBasedAuthenticationSupplicantNum: 0
```

Interface	VID	Mode	MAC Address	Status	IP Address	Username
=====	===	====	=====	=====	=====	=====
port1.0.2	2	D	00d0.59ab.7037	Authenticated	192.168.2.201	manager

Related [show dot1x supplicant commands](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

undebug dot1x

Overview This command applies the functionality of the **no** variant of the **debug dot1x**.

43 Authentication Commands

- Contents**
- **Introduction** on page 2155
 - **auth auth-fail vlan** on page 2156
 - **auth critical** on page 2159
 - **auth dhcp-framed-ip-lease** on page 2160
 - **auth dynamic-acl enable** on page 2162
 - **auth dynamic-vlan-creation** on page 2164
 - **auth guest-vlan** on page 2167
 - **auth guest-vlan forward** on page 2170
 - **auth guest-vlan hw-forwarding** on page 2172
 - **auth host-mode** on page 2173
 - **auth log** on page 2176
 - **auth max-supPLICANT** on page 2178
 - **auth max-supPLICANT tagged-vlan** on page 2180
 - **auth max-supPLICANT untagged-vlan** on page 2182
 - **auth multi-vlan-session** on page 2184
 - **auth priority** on page 2186
 - **auth profile (global)** on page 2188
 - **auth profile (interface)** on page 2189
 - **auth reauthentication** on page 2190
 - **auth roaming disconnected** on page 2191
 - **auth roaming enable** on page 2193
 - **auth supplicant-ip** on page 2195
 - **auth supplicant-mac** on page 2198
 - **auth timeout connect-timeout** on page 2203
 - **auth timeout quiet-period** on page 2205
 - **auth timeout reauth-period** on page 2206
 - **auth timeout server-timeout** on page 2208
 - **auth timeout supp-timeout** on page 2210
 - **auth vlan-restriction** on page 2211
 - **auth two-step enable** on page 2213
 - **auth two-step order** on page 2216
 - **auth-mac accounting** on page 2218
 - **auth-mac authentication** on page 2219
 - **auth-mac enable** on page 2220
 - **auth-mac method** on page 2222
 - **auth-mac password** on page 2224
 - **auth-mac reauth-relearning** on page 2226

- **auth-mac static** on page 2227
- **auth-mac username** on page 2228
- **auth-web accounting** on page 2229
- **auth-web authentication** on page 2230
- **auth-web enable** on page 2231
- **auth forward** on page 2233
- **auth-web idle-timeout enable** on page 2237
- **auth-web idle-timeout timeout** on page 2238
- **auth-web max-auth-fail** on page 2239
- **auth-web method** on page 2241
- **auth-web-server blocking-mode** on page 2242
- **auth-web-server dhcp ipaddress** on page 2243
- **auth-web-server dhcp lease** on page 2245
- **auth-web-server dhcp-wpad-option** on page 2246
- **auth-web-server host-name** on page 2247
- **auth-web-server intercept-port** on page 2248
- **auth-web-server ip-conflict-prefer-newer-supPLICANT** on page 2250
- **auth-web-server ipaddress** on page 2251
- **auth-web-server page language** on page 2252
- **auth-web-server login-url** on page 2253
- **auth-web-server page logo** on page 2254
- **auth-web-server page sub-title** on page 2255
- **auth-web-server page success-message** on page 2256
- **auth-web-server page title** on page 2257
- **auth-web-server page welcome-message** on page 2258
- **auth-web-server ping-poll enable** on page 2259
- **auth-web-server ping-poll failcount** on page 2260
- **auth-web-server ping-poll interval** on page 2261
- **auth-web-server ping-poll reauth-timer-refresh** on page 2262
- **auth-web-server ping-poll timeout** on page 2263
- **auth-web-server ping-poll type** on page 2264
- **auth-web-server port** on page 2266
- **auth-web-server redirect-delay-time** on page 2267
- **auth-web-server redirect-url** on page 2268
- **auth-web-server session-keep** on page 2269
- **auth-web-server ssl** on page 2270
- **auth-web-server ssl intercept-port** on page 2271
- **auth-web-server trustpoint** on page 2272
- **copy proxy-autoconfig-file** on page 2274
- **copy web-auth-https-file** on page 2275
- **description (auth-profile)** on page 2276
- **erase proxy-autoconfig-file** on page 2277
- **erase web-auth-https-file** on page 2278
- **show auth** on page 2279
- **show auth diagnostics** on page 2281
- **show auth interface** on page 2283
- **show auth sessionstatistics** on page 2285

- **show auth statistics interface** on page 2286
- **show auth supplicant** on page 2287
- **show auth supplicant interface** on page 2290
- **show auth two-step supplicant brief** on page 2291
- **show auth-web-server** on page 2293
- **show auth-web-server page** on page 2294
- **show proxy-autoconfig-file** on page 2295

Introduction

Overview Port authentication commands enable you to specify three different types of device authentication: 802.1X authentication, web authentication, and MAC authentication.

- 802.1X is an IEEE standard providing a mechanism for authenticating devices attached to a LAN port or wireless device.
- Web authentication is applicable to devices that have a human user who opens the web browser and types in a user name and password when requested.
- MAC authentication is used to authenticate devices that have neither a human user nor implement 802.1X supplicant when making a network connection request.

This chapter provides an alphabetical reference for MAC and web authentication commands. For a list of 802.1X commands see the **802.1X Commands** chapter.

For more information on configuring and using port authentication, see the **AAA and Port Authentication Feature Overview and Configuration Guide**.

auth auth-fail vlan

Overview Use this command to enable the **auth-fail vlan** feature on the specified vlan interface. This feature assigns supplicants (client devices) to the specified VLAN if they fail port authentication.

Use the **no** variant of this command to disable the auth-fail vlan feature for a specified VLAN interface.

Syntax auth auth-fail vlan <1-4094>
no auth auth-fail vlan

Parameter	Description
<1-4094>	Assigns the VLAN ID to any supplicants that have failed port authentication.

Default The auth-fail vlan feature is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Use the auth-fail vlan feature when using web authentication instead of the Guest VLAN feature, when you need to separate networks where one supplicant (client device) requires authentication and another supplicant does not require authentication from the same interface.

This is because the DHCP lease time using the Web-Authentication feature is shorter, and the auth-fail vlan feature enables assignment to a different VLAN if a supplicant fails authentication.

To enable the auth-fail vlan feature with web authentication, you need to set the web authentication server virtual IP address by using the **auth-web-server ipaddress** or the **auth-web-server dhcp ipaddress**.

When using 802.1X port authentication, use a **dot1x max-auth-fail** command to set the maximum number of login attempts. Three login attempts are allowed by default for 802.1X port authentication before supplicants trying to authenticate are moved from the Guest VLAN to the auth-fail VLAN. See the **dot1x max-auth-fail** for command information.

See the **AAA and Port Authentication Feature Overview and Configuration Guide** for information about:

- the auth-fail VLAN feature, which allows the Network Administrator to separate the supplicants who attempted authentication, but failed, from the supplicants who did not attempt authentication, and
- restrictions regarding combinations of authentication enhancements working together

Use appropriate ACLs (Access Control Lists) on interfaces for extra security if a supplicant allocated to the designated auth-fail vlan can access the same network as a supplicant on the Guest VLAN. For more information about ACL concepts, and configuring ACLs see the **ACL Feature Overview and Configuration Guide**. For more information about ACL commands see:

- **IPv4 Hardware Access Control List (ACL) Commands**
- **IPv4 Software Access Control List (ACL) Commands**
- **IPv6 Hardware Access Control List (ACL) Commands**
- **IPv6 Software Access Control List (ACL) Commands**

Examples To enable the auth-fail vlan feature for port1.0.2 and assign VLAN 100, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth auth-fail vlan 100
```

To disable the auth-fail vlan feature for port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth auth-fail vlan
```

Related commands **auth profile (global)**
dot1x max-auth-fail
show dot1x
show dot1x interface
show running-config

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth critical

Overview Use this command to enable the critical port feature on the interface. When the critical port feature is enabled on an interface, and all the RADIUS servers are unavailable, then the interface becomes authorized. The **no** variant of this command disables the critical port feature on the interface.

Syntax `auth critical`
`no auth critical`

Default The critical port of port authentication is disabled.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To enable the critical port feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth critical
```

To disable the critical port feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth critical
```

To enable the critical port feature on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth critical
```

Related commands [auth profile \(global\)](#)
[show auth-web-server](#)
[show dot1x](#)
[show dot1x interface](#)
[show running-config](#)

auth dhcp-framed-ip-lease

Overview Use this command to enable DHCP Framed IP Lease on an interface.

When the DHCP Framed IP Lease feature is enabled on an interface, supplicants authenticated using 802.1x or MAC authentication will be assigned a specific IP address, and other network settings, gathered from the RADIUS server during the authentication process.

Use the **no** variant of this command to disable DHCP Framed IP Lease.

Syntax `auth dhcp-framed-ip-lease`
`no auth dhcp-framed-ip-lease`

Default DHCP Framed IP Lease is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes You need to complete the following steps to configure the DHCP Framed IP Lease feature on your network.

On the RADIUS server:

- Configure the RADIUS server with the username and password for 802.1x or MAC authentication
- Configure the following 'framed' RADIUS attributes on the RADIUS server for the that user:
 - Framed-IP-Address (8): the IPv4 address for the supplicant
 - Framed-IP-Netmask (9): the netmask for the supplicant
 - Framed-Route (22): the default gateway IPv4 address for the supplicant
 - Session-Timeout (27): IP address lease time for the supplicant

NOTE: The *Frame-IP-Address (8)* attribute must be configured for this feature to work. All other attributes are optional.

On the DHCP server:

- Configure the RADIUS client
- Enable 802.1x or MAC authentication on the required interface/s
- Enable DHCP Framed IP Lease feature on the required interface/s
- Setup a DHCP pool with the network range for the IP address/es registered on the RADIUS server
- Enable DHCP server

For more information, see the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Example To enable DHCP Framed IP Lease on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# auth dhcp-framed-ip-lease
```

To disable DHCP Framed IP Lease on port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no auth dhcp-framed-ip-lease
```

Related commands [show dot1x supplicant](#)
[show ip dhcp pool](#)

Command changes Version 5.4.8-2.1: command added

auth dynamic-acl enable

Overview Use this command to enable Dynamic Access Control Lists (ACLs). This lets you configure port authentication to dynamically apply ACLs when a supplicant is authorized. These ACLs are automatically removed when the supplicant disconnects.

Use the **no** variant of this command to disable Dynamic ACLs.

Syntax `auth dynamic-acl enable`
`no auth dynamic-acl enable`

Default Disabled.

Mode Interface configuration for switch port or static aggregator.

Usage notes Dynamic ACLs are created and attached to a switchport in the following way:

- A RADIUS server holds the ACL rules for a supplicant, along with that supplicants user name and password.
- These ACL rules can be either:
 - a complete IPv4 or IPv6 hardware rule (stored as a RADIUS NAS-Filter-Rule attribute), or
 - name or number reference to an existing ACL rule (stored as a RADIUS Filter-Id attribute)
- When the first packet from a supplicant arrives on a switchport the authenticator starts the authentication process with the RADIUS server.
- The RADIUS server returns Access-Accept packet to the authenticator with the configured ACL rules.
- The authenticator creates and installs these ACLs dynamically on the switchport and authorizes the supplicant.
- These Dynamic ACLs are named IPv4 and IPv6 hardware access-lists. They are internally maintained and cannot be removed or modified from the CLI.
- All traffic on the switchport is filtered using these ACLs.
- When the supplicant is unauthorized, dynamically installed ACLs are removed and detached from the switchport.

For more information, see the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Examples This example uses the local RADIUS server to define two ACL rules that are applied to MAC authenticated supplicants on port1.0.2.

Define the local RADIUS server as the RADIUS server to use:

```
awplus# configure terminal
awplus(config)# radius-server host 127.0.0.1 key awplus-local-radius-server
```

Define the authentication method list:

```
awplus(config)# aaa authentication auth-mac default group radius
```

Enable MAC authentication and dynamic ACLs on port1.0.2:

```
awplus(config)# interface port1.0.2
awplus(config-if)# auth-mac enable
awplus(config-if)# auth dynamic-acl enable
awplus(config-if)# exit
```

Configure the local RADIUS server with the required ACL rules:

```
awplus(config)# radius-server local
awplus(config-radsrv)# group dacl-rule
awplus(config-radsrv-group)# attribute repeated NAS-Filter-Rule
"ip:permit ip 192.168.1.0/24 192.168.2.0/24"
awplus(config-radsrv-group)# attribute repeated NAS-Filter-Rule
"ip:deny ip 192.168.1.0/24 any"
awplus(config-radsrv-group)# exit
```

Add a user with the Dynamic ACL rules and enable the local RADIUS server:

```
awplus(config-radsrv)# user xx-xx-xx-xx-xx-xx password xx-xx-xx-xx-xx-x group dacl-rule
awplus(config-radsrv)# server enable
awplus(config-radsrv)# exit
```

These ACL rules will reject IP traffic from 192.168.1.x to any destination except 192.168.2.x for supplicants on port1.0.2.

Related commands

- attribute (radsrv-grp)**
- radius-server local**
- show access-list (IPv4 Hardware ACLs)**
- show ipv6 access-list (IPv6 Hardware ACLs)**
- show auth supplicant**
- user (radsrv)**

Command changes Version 5.5.0-1.1: command added

auth dynamic-vlan-creation

Overview Use this command to enable and disable the Dynamic VLAN assignment feature.

The Dynamic VLAN assignment feature allows a supplicant (client device) to be placed into a specific VLAN based on information returned from the RADIUS server during authentication, on a given interface.

Use the **no** variant of this command to disable the Dynamic VLAN assignment feature.

Syntax `auth dynamic-vlan-creation [rule {deny|permit}] [type {multi|single}]`
`no auth dynamic-vlan-creation`

Parameter	Description
rule	VLAN assignment rule.
deny	Deny a differently assigned VLAN ID. This is the default rule.
permit	Permit a differently assigned VLAN ID.
type	Specifies whether multiple different VLANs can be assigned to supplicants (client devices) attached to the port, or whether only a single VLAN can be assigned to supplicants on the port.
multi	Multiple Dynamic VLAN.
single	Single Dynamic VLAN.

Default By default, the Dynamic VLAN assignment feature is disabled.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes If the Dynamic VLAN assignment feature is enabled, VLAN assignment is dynamic. If the Dynamic VLAN assignment feature is disabled then RADIUS attributes are ignored and configured VLANs are assigned to ports. Dynamic VLANs may be associated with authenticated MAC addresses if the **type** parameter is applied with the **rule** parameter.

The **rule** parameter deals with the case where there are multiple supplicants attached to a port, and the type parameter has been set to **single-vlan**. The parameter specifies how the switch should act if different VLAN IDs end up being assigned to different supplicants. The keyword value **deny** means that once a given VID has been assigned to the first supplicant, then if any subsequent supplicant is assigned a different VID, that supplicant is rejected. The keyword value **permit** means that once a given VID has been assigned to the first supplicant, then if any subsequent supplicant is assigned a different VID, that supplicant is accepted, but it is actually assigned the same VID as the first supplicant.

If you issue an **auth dynamic-vlan-creation** command without a **rule** parameter then a second supplicant with a different VLAN ID is rejected. It is not assigned to the first supplicant's VLAN. Issuing an **auth dynamic-vlan-creation** command without a **rule** parameter has the same effect as issuing an **auth dynamic-vlan-creation rule deny** command rejecting supplicants with differing VLANs.

The **type** parameter specifies whether multiple different VLANs can be assigned to supplicants attached to the port, or whether only a single VLAN can be assigned to supplicants on the port. The **type** parameter can select the port base VLAN or the MAC base VLAN from the RADIUS VLAN ID. This can be used when the host-mode is set to multi-supplicant. For **single**-host ports, the VLAN ID will be assigned to the port. It is not supported with the Guest VLAN feature. Display the ID assigned using a **show vlan** command. For **multi**-host ports, the VLAN ID will be assigned to the MAC address of the authenticated supplicant. The VLAN ID assigned for the MAC Base VLAN is displayed using the **show platform table vlan** command.

To configure Dynamic VLAN with Web Authentication, you need to set the Web Authentication Server virtual IP address by using the **auth-web-server ipaddress** command or the **auth-web-server dhcp ipaddress** command. You also need to create a hardware access-list that can be applied to the switch port interface.

You need to configure an IPv4 address for the VLAN interface on which Web Authentication is running.

Examples To enable the Dynamic VLAN assignment feature on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport access vlan 10
awplus(config-if)# auth-web enable
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# interface vlan10
awplus(config-if)# ip address 10.1.1.1/24
```

To enable the Dynamic VLAN assignment feature with Web Authentication on interface port1.0.2 when Web Authentication is needed, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ipaddress 1.2.3.4
awplus(config)# access-list hardware acl-web send-to-cpu ip any
1.2.3.4
awplus(config)# interface port1.0.2
awplus(config-if)# auth-web enable
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# access-group acl-web
awplus(config-if)# interface vlan1
awplus(config-if)# ip address 10.1.1.1/24
```

To disable the Dynamic VLAN assignment feature on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth dynamic-vlan-creation
```

To enable the Dynamic VLAN assignment feature on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth dynamic-vlan-creation
```

Related commands

- auth profile (global)**
- auth host-mode**
- show dot1x**
- show dot1x interface**
- show running-config**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth guest-vlan

Overview Use this command to enable and configure the Guest VLAN feature on the interface specified by associating a Guest VLAN with an interface. This command does not start authentication. The supplicant's (client device's) traffic is associated with the native VLAN of the interface unless it is already associated with another VLAN. The **routing** option enables routing from the Guest VLAN to another VLAN, so the switch can lease DHCP addresses and accept access to a limited network.

The **no** variant of this command disables the guest VLAN feature on the interface specified.

Syntax `auth guest-vlan <1-4094> [routing]`
`no auth guest-vlan [routing]`

Parameter	Description
<1-4094>	VLAN ID (VID).
routing	Enables routing from the Guest VLAN to other VLANs.

Default The Guest VLAN authentication feature is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes The Guest VLAN feature may be used by supplicants (client devices) that have not attempted authentication, or have failed the authentication process. Note that if a port is in multi-supplicant mode with per-port dynamic VLAN configuration, after the first successful authentication, subsequent hosts cannot use the guest VLAN due to the change in VLAN ID. This may be avoided by using per-user dynamic VLAN assignment.

When using the Guest VLAN feature with the multi-host mode, a number of supplicants can communicate via a guest VLAN before authentication. A supplicant's traffic is associated with the native VLAN of the specified switch port. The supplicant must belong to a VLAN before traffic from the supplicant can be associated.

Note that you must enable 802.1X on the port and define a VLAN using the **vlan** command before you can configure it as a guest VLAN.

Roaming Authentication cannot be enabled if DHCP snooping is enabled (**service dhcp-snooping** command), and vice versa.

Note that Guest VLAN can use only untagged ports.

See the **AAA and Port Authentication Feature Overview and Configuration Guide** for information about:

- Guest VLAN, and
- restrictions regarding combinations of authentication enhancements working together

Examples To define vlan100 and assign the guest VLAN feature to vlan100 on interface port1.0.2, and enable routing from the guest VLAN to other VLANs, use the following commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 100
awplus(config-vlan)# exit
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth guest-vlan 100 routing
```

To disable the guest VLAN feature on port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth guest-vlan
```

To define vlan100 and assign the guest VLAN feature to vlan100 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# vlan database
awplus(config-vlan)# vlan 100
awplus(config-vlan)# exit
awplus(config)# auth profile student
awplus(config-auth-profile)# auth guest-vlan 100
```

Related commands

- auth profile (global)**
- auth guest-vlan forward**
- dot1x port-control**
- show dot1x**
- show dot1x interface**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth guest-vlan forward

Overview Use this command to enable packet forwarding from the guest VLAN to a destination IP address or subnet. If this command is configured, the device can lease DHCP addresses and accept access to a limited part of your network. Also, when using NAP authentication, the supplicant can log on to a domain controller to gain certification.

Use the **no** variant of this command to disable packet forwarding from the Guest VLAN to a destination IP address or subnet.

Syntax `auth guest-vlan forward {<ip-address>|<ip-address/mask>} [dns | tcp <1-65535>|udp <1-65535>]`
`no auth guest-vlan forward {<ip-address>|<ip-address/mask>} [dns|tcp <1-65535>|udp <1-65535>]`

Parameter	Description
<code><ip-address><ip-address/mask></code>	The IP address or subnet to which the guest VLAN can forward packets, in dotted decimal notation
<code>dns</code>	Enable forwarding of DNS packets
<code>tcp <1-65535></code>	Enable forwarding of packets for the specified TCP port number
<code>udp <1-65535></code>	Enable forwarding of packets for the specified UDP port number

Default Forwarding is disabled by default.

Mode Interface Configuration mode for a specified switch port, or Authentication Profile mode

Usage Before using this command, you must configure the guest VLAN with the **auth guest-vlan** command.

Example To enable packet forwarding from the guest VLAN to the destination IP address on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth guest-vlan forward 10.0.0.1
```

To enable forwarding of DNS packets from the guest VLAN to the destination IP address on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface
awplus(config-if)# auth guest-vlan forward 10.0.0.1 dns
```

To disable forwarding of DNS packets from the guest VLAN to the destination IP address on port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth guest-vlan forward 10.0.0.1 dns
```

To enable the TCP forwarding port 137 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth guest-vlan forward 10.0.0.1
tcp 137
```

Related commands [auth guest-vlan](#)
[auth profile \(global\)](#)
[show running-config](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth guest-vlan hw-forwarding

Overview Use this command to enable hardware forwarding on the guest VLAN. By default, hardware forwarding is disabled and all traffic on the VLAN is forwarded by the CPU.

Use the **no** variant of this command to disable hardware forwarding on the guest VLAN.

Syntax `auth guest-vlan hw-forwarding`
`no auth guest-vlan hw-forwarding`

Default Disabled.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To enable guest VLAN hardware forwarding on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth guest-vlan hw-forwarding
```

To disable guest VLAN hardware forwarding on port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth guest-vlan hw-forwarding
```

To enable guest VLAN hardware forwarding authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth guest-vlan hw-forwarding
```

Related commands [auth profile \(global\)](#)
[auth guest-vlan](#)
[auth guest-vlan forward](#)

Command changes Version 5.5.0-1.1: command added to x230, GS970M, IE210 series switches.
Version 5.5.1-0.1: command added to all other AlliedWare Plus switches.

auth host-mode

Overview Use this command to select the host mode on the specified interface.

Use the **no** variant of this command to set host mode to the default setting (single host).

Syntax `auth host-mode {host-plus-voice|single-host|multi-host|multi-supPLICANT}`
`no auth host-mode`

Parameter	Description
host-plus-voice	In this mode, only one voice device (IP phone) and one host device can join the network. You use the RADIUS attribute 'Cisco-AVPair device-traffic-class=voice' to identify the IP phone. For more information and a step-by-step configuration example, see the "Limit the number of supplicants when connecting via an IP phone" section of the AAA and Port Authentication Feature Overview and Configuration Guide .
single-host	In this mode, only one supplicant is allowed per port. This is the default mode.
multi-host	In this mode, once the first host on a port is authenticated, all other downstream hosts are allowed without being authenticated (piggy-back mode).
multi-supPLICANT	In this mode, multiple separate supplicants are individually authenticated on one port.

Default The default host mode for port authentication is for a single host.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes **Single-host mode**

With this mode, only one supplicant may be authenticated on the port. Once that host has been authenticated, no other supplicants may be authenticated until the first supplicant's session has closed. This means, of course, that none of the other hosts downstream of the port will be able to send or receive traffic on that port.

This option is recommended when you know that there should only be one host connected to a port. By limiting the port to a single authenticated host, you guard against the consequences of someone accidentally or maliciously connecting a downstream switch to the port.

Multi-host mode

With this mode, once the first host has been authenticated on the port, all other downstream hosts are allowed without being authenticated. This is sometimes known as piggy-back mode. It is useful when the downstream switch attached to the authenticating port is an intelligent switch that can act as an authentication supplicant.

If you trust that malicious users cannot be connected to that switch but you do not know the identity of those users, then you can simply authenticate the switch and then allow its attached users to have network access. If the valid switch is disconnected and an invalid one is connected which is not configured with the correct authentication credentials, then the devices connected to the invalid switch will be blocked from accessing the network.

Examples To set the host mode to multi-suppliant on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth host-mode multi-suppliant
```

To set the host mode to the default (single host) on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth host-mode
```

To set the host mode to multi-suppliant on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth host-mode multi-suppliant
```

To set the host mode to the default (single host) on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth host-mode
```

Related commands **auth profile (global)**
show dot1x
show dot1x interface
show running-config

Command changes Version 5.5.2-1.1: **host-plus-voice** parameter added

auth log

Overview Use this command to configure the types of authentication feature log messages that are output to the log file.

Use the **no** variant of this command to remove either specified types or all types of authentication feature log messages that are output to the log file.

Syntax `auth log {dot1x|auth-mac|auth-web} {success|failure|logoff|all}`
`no auth log {dot1x|auth-mac|auth-web} {success|failure|logoff|all}`

Parameter	Description
dot1x	Specify only 802.1X-Authentication log messages are output to the log file.
auth-mac	Specify only MAC-Authentication log messages are output to the log file.
auth-web	Specify only Web-Authentication log messages are output to the log file.
success	Specify only successful authentication log messages are output to the log file.
failure	Specify only authentication failure log messages are output to the log file.
logoff	Specify only authentication log-off messages are output to the log file. Note that link down, age out and expired ping polling messages will be included.
all	Specify all types of authentication log messages are output to the log file. Note that this is the default behavior for the authentication logging feature.

Default All types of authentication log messages are output to the log file by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To configure the logging of MAC authentication failures to the log file for supplicants (client devices) connected to interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth log auth-mac failure
```

To disable the logging of all types of authentication log messages to the log file for auth-mac supplicants (client devices) connected to interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth log auth-mac all
```

To configure the logging of web authentication failures to the log file for supplicants (client devices) connected to authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth log auth-web failure
```

To disable the logging of all types of authentication log messages to the log file for auth-mac supplicants (client devices) connected to authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth log auth-mac all
```

Related commands [auth profile \(global\)](#)
[show running-config](#)

auth max-suppliant

Overview Use this command to set the maximum number of supplicants (client devices) that can be authenticated on the selected port. Once this value is exceeded, further supplicants will not be authenticated.

The **no** variant of this command resets the maximum supplicant number to the default.

Syntax `auth max-suppliant <2-1024>`
`no auth max-suppliant`

Parameter	Description
<code><2-1024></code>	Limit number.

Default 1024

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the maximum number of supplicants to 10 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth max-suppliant 10
```

To reset the maximum number of supplicants to the default value on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth max-suppliant
```

To set the maximum number of supplicants to 10 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth max-suppliant 10
```

To reset the maximum number of supplicants to the default value on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth max-suppliant
```

Related commands

- auth max-supPLICANT tagged-vlan**
- auth max-supPLICANT untagged-vlan**
- auth profile (global)**
- show dot1x**
- show dot1x interface**
- show running-config**

auth max-supPLICant tagged-vlan

Overview Use this command to set the maximum number of supplicants (client devices) that can be authenticated on the selected port on tagged VLANs. Once this value is exceeded, further supplicants will not be authenticated on tagged VLANs on that port.

This command is useful for preventing unwanted supplicants from connecting to the network when a host (e.g. a PC) connects to an AlliedWare Plus NAS via an IP phone. For more information and a step-by-step configuration example, see the "Limit the number of supplicants when connecting via an IP phone" section of the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Use the **no** variant of this command to reset the maximum number of supplicants on tagged VLANs to the default.

Syntax `auth max-supPLICant tagged-vlan <0-1024>`
`no auth max-supPLICant tagged-vlan <0-1024>`

Default 1024

Mode Interface Configuration for a switch port; or Authentication Profile mode.

Examples To set the maximum number of supplicants on tagged VLANs on interface port1.0.2 to 1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth max-supPLICant tagged-vlan 1
```

To reset the maximum number of supplicants on tagged VLANs on interface port1.0.2 to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth max-supPLICant tagged-vlan
```

To set the maximum number of supplicants on tagged VLANs on authentication profile 'accounts' to 1, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile accounts
awplus(config-auth-profile)# auth max-supPLICant tagged-vlan 1
```

To reset the maximum number of supplicants on tagged VLANs on authentication profile 'accounts' to the default value, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile accounts
awplus(config-auth-profile)# no auth max-supPLICant tagged-vlan
```


Related **auth max-suppliant**
commands **auth max-suppliant untagged-vlan**

Command Version 5.5.2-1.1: command added
changes

auth max-suppliant untagged-vlan

Overview Use this command to set the maximum number of supplicants (client devices) that can be authenticated on the selected port on untagged VLANs. Once this value is exceeded, further supplicants will not be authenticated on untagged VLANs on that port.

This command is useful for preventing unwanted supplicants from connecting to the network when a host (e.g. a PC) connects to an AlliedWare Plus NAS via an IP phone. For more information and a step-by-step configuration example, see the "Limit the number of supplicants when connecting via an IP phone" section of the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Use the **no** variant of this command to reset the maximum number of supplicants on untagged VLANs to the default.

Syntax `auth max-suppliant untagged-vlan <0-1024>`
`no auth max-suppliant untagged-vlan <0-1024>`

Default 1024

Mode Interface Configuration for a switch port; or Authentication Profile mode.

Examples To set the maximum number of supplicants on untagged VLANs on interface port1.0.2 to 1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth max-supPLICant untagged-vlan 1
```

To reset the maximum number of supplicants on untagged VLANs on interface port1.0.2 to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth max-supPLICant untagged-vlan
```

To set the maximum number of supplicants on untagged VLANs on authentication profile 'accounts' to 1, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile accounts
awplus(config-auth-profile)# auth max-supPLICant untagged-vlan 1
```

To reset the maximum number of supplicants on untagged VLANs on authentication profile 'accounts' to the default value, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile accounts
awplus(config-auth-profile)# no auth max-supPLICant untagged-vlan
```

Related commands [auth max-supPLICant](#)
[auth max-supPLICant tagged-vlan](#)

Command changes Version 5.5.2-1.1: command added

auth multi-vlan-session

Overview Use this command to enable packet forwarding on multiple VLANs for an authenticated supplicant attached to a trunked (tagged VLAN) port.

By default, AlliedWare Plus only allows packet forwarding on the VLAN that a device was authenticated on. This command enables packet forwarding to the attached device on any VLAN configured on the switchport. After the device authenticates it will have access to all VLANs configured on the switchport.

Use the **no** variant of this command to disable packet forwarding on multiple VLANs for an authenticated supplicant.

Syntax `auth multi-vlan-session`
`no auth multi-vlan-session`

Default By default, **multi-vlan-session** is disabled.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To allow a client attached to port1.0.2 to access all VLANs configured on the AlliedWare Plus device, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode trunk
awplus(config-if)# switchport trunk allowed vlan all
awplus(config-if)# auth host-mode multi-supplicant
awplus(config-if)# auth multi-vlan-session
```

To disable **multi-vlan-session** on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth multi-vlan-session
```

Related commands

- auth-mac enable**
- auth-web enable**
- dot1x port-control**
- show auth interface**
- show dot1x interface**

Command changes Version 5.4.8-1.1: command added
Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth priority

Overview Use this command to enable authentication priority on an interface. This sets the tri-authentication order of priority for MAC, 802.1X, and web-based authentication. If tri-authentication is not configured on the interface then this command has no effect.

You specify the authentication methods in order of priority. The first method in the list has the highest priority, the second method has the second highest priority, and the third method has the lowest priority. Any methods not specified will have the lowest priority.

Use the **no** variant of this command to disable authentication priority.

Syntax `auth priority {[auth-mac] [dot1x] [auth-web]}`
`no auth priority`

Parameter	Description
auth-mac	Set MAC authentication priority.
dot1x	Set 802.1X authentication priority.
auth-web	Set web-based authentication priority.

Default Authentication priority is not set.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Before using this command you must correctly configure tri-authentication on the interface. Tri-authentication is when multiple authentication methods (MAC, 802.1X, and/or web-based) are configured on the same interface. With tri-authentication, a supplicant is authorized to use the network as soon as they are successfully authenticated by any of the configured authentication methods.

When authentication priority is not set, once a supplicant is authenticated any future attempts to authenticate are ignored. When, however, authentication priority is set, and a higher priority authentication attempt is made by the supplicant, a new authentication process starts. The supplicant will then be authorized, or unauthorized, based on the result of this new authentication attempt.

Example To configure 802.1X authentication to have a higher priority than MAC authentication on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access
awplus(config-if)# auth-mac enable
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth priority dot1x auth-mac
```

To disable authentication priority on interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth priority
```

To configure 802.1X authentication to have a higher priority than MAC authentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-if)# switchport mode access
awplus(config-if)# auth-mac enable
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth priority dot1x auth-mac
```

Related commands

- auth profile (interface)**
- auth-mac enable**
- auth-web enable**
- dot1x port-control**

Command changes Version 5.5.0-2.1: command added

auth profile (global)

Overview Use this command to enter port authentication profile mode and configure a port authentication profile.

If the specified profile does not exist a new authentication profile is created with the name provided.

Use the **no** variant of this command to delete the specified port authentication profile.

Syntax `auth profile <profile-name>`
`no auth profile <profile-name>`

Parameter	Description
<code><profile-name></code>	Name of the profile to create or configure.

Default No port authentication profiles are created by default.

Mode Global Configuration

Usage A port authentication profile is a configuration object that aggregates multiple port authentication commands. These profiles are attached or detached from an interface using the **auth profile (interface)** command.

Example To create a new authentication profile 'student', use the following commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)#
```

To delete an authentication profile 'student', use the following commands:

```
awplus# configure terminal
awplus(config)# no auth profile student
```

Related commands **auth profile (interface)**
description (auth-profile)

auth profile (interface)

Overview Use this command to attach a port authentication profile to the current interface.

Use the **no** variant of this command to detach a port authentication profile from the current interface.

Syntax `auth profile <profile-name>`
`no auth profile <profile-name>`

Parameter	Description
<code><profile-name></code>	The name of the profile to attach to the current interface.

Default No profile is attached by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage This command attaches an authentication profile, that was created using the **auth profile (global)** command, to a static channel, a dynamic (LACP) channel group, or a switch port.

You can only attach one profile to an interface at a time. Use the **no** variant of the command to detach a profile before attempting to attach another one.

Example To attach the authentication profile 'student' to port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth profile student
```

To detach the authentication profile 'student' from port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth profile student
```

Related commands **auth profile (global)**

auth reauthentication

Overview Use this command to enable re-authentication on the interface specified in the Interface mode, which may be a static channel group (or static aggregator) or a dynamic (or LACP) channel group or a switch port.

Use the **no** variant of this command to disable reauthentication on the interface.

Syntax `auth reauthentication`
`no auth reauthentication`

Default Reauthentication of port authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To enable reauthentication on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth reauthentication
```

To disable reauthentication on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth reauthentication
```

To enable reauthentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth reauthentication
```

Related commands [auth profile \(global\)](#)
[show dot1x](#)
[show dot1x interface](#)
[show running-config](#)

auth roaming disconnected

Overview This command allows a supplicant to move to another authenticating interface without reauthentication, even if the link is down for the interface that the supplicant is currently connected to.

You must enter the **auth roaming enable** command on both interfaces before using this command.

The **no** variant of this command disables roaming authentication on interfaces that are link-down, and forces a supplicant to be reauthenticated when moving between interfaces.

See the **AAA and Port Authentication Feature Overview and Configuration Guide** for further information about this feature.

Syntax auth roaming disconnected
no auth roaming disconnected

Default By default, the authentication status for a roaming supplicant is deleted when an interface goes down, so supplicants must reauthenticate.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Note that 802.1X port authentication, MAC-authentication, or Web-authentication must be configured before using this feature. The port that the supplicant is moving to must have the same authentication configuration as the port the supplicant is moving from.

Roaming Authentication cannot be enabled if DHCP snooping is enabled (**service dhcp-snooping** command), and vice versa.

Examples To allow supplicants to move from port1.0.2 without reauthentication even when the link is down, when using 802.1X authentication, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth roaming enable
awplus(config-if)# auth roaming disconnected
```

To require supplicants to reauthenticate when moving from port1.0.2 if the link is down, when using 802.1X authentication, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth roaming disconnected
```

To allow supplicants using authentication profile 'student' to move between ports without reauthentication even when the link is down, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth roaming disconnected
```

To require supplicants using authentication profile 'student' to reauthenticate when moving between ports if the link is down, use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth roaming disconnected
```

Related commands

- auth profile (global)**
- auth-mac enable**
- auth roaming enable**
- auth-web enable**
- dot1x port-control**
- show auth interface**
- show dot1x interface**
- show running-config**

auth roaming enable

Overview Use this command to allow a supplicant to move to another authenticating interface without reauthentication, providing the link is up for the interface that the supplicant is currently connected to.

The **no** variant of this command disables roaming authentication on an interface, and forces a supplicant to be reauthenticated when moving between interfaces.

See the [AAA and Port Authentication Feature Overview and Configuration Guide](#) for further information about this feature.

Syntax auth roaming enable
no auth roaming enable

Default Roaming authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Note that 802.1X port authentication, MAC authentication, or web-based authentication must be configured before using this feature. The port that the supplicant is moving to must have the same authentication configuration as the port the supplicant is moving from.

This command only enables roaming authentication for links that are up. If you want roaming authentication on links that are down, you must also use the command [auth roaming disconnected](#).

Roaming Authentication cannot be enabled if DHCP snooping is enabled ([service dhcp-snooping](#) command), and vice versa.

Examples To enable roaming authentication for port1.0.4, when using auth-mac authentication, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# auth-mac enable
awplus(config-if)# auth roaming enable
```

To disable roaming authentication for port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# no auth roaming enable
```

To enable roaming authentication for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth roaming enable
```

Related commands

- auth profile (global)**
- auth-mac enable**
- auth roaming disconnected**
- auth-web enable**
- dot1x port-control**
- show auth interface**
- show dot1x interface**
- show running-config**

auth supplicant-ip

Overview Use this command to add a supplicant (client device) IP address on a given interface.

Use the **no** variant of this command to delete the supplicant IP address and reset other parameters to their default values. The IP address can be determined before authentication for auth-web clients only.

Syntax `auth supplicant-ip <ip-addr> [max-reauth-req <1-10>] [max-req <1-10>] [port-control {auto|force-authorized|force-unauthorized|skip-second-auth}] [quiet-period <1-65535>] [reauthentication] [reauth-period <1-4294967295>] [supp-timeout <1-65535>] [server-timeout <1-65535>]`
`no auth supplicant-ip <ip-addr> [reauthentication]`

Parameter	Description
<code><ip-addr></code>	IP address of the supplicant entry in A.B.C.D/P format.
<code>max-reauth-req <1-10></code>	Number of reauthentication attempts before becoming unauthorized (default 2).
<code>max-req <1-10></code>	Number of times the device resends an EAP Request packet if that packet is lost between the authenticating device and the specified supplicant (default 2, which is 3 transmission attempts in total). If the supplicant does not respond to an EAP Request after this number of retries, the supplicant fails the authentication process.
<code>port-control</code>	Port control options: auto: Allow port client to negotiate authentication force-authorized: Force port state to authorized force-unauthorized: Force port state to unauthorized skip-second-auth: Skip second authentication step.
<code>quiet-period <1-65535></code>	Quiet period in the HELD state in seconds (default 60 seconds).
<code>reauthentication</code>	Enable reauthentication on a port.
<code>reauth-period <1-4294967295></code>	Seconds between reauthorization attempts (default 3600 seconds).
<code>supp-timeout <1-65535></code>	Supplicant response timeout in seconds (default 30 seconds).
<code>server-timeout <1-65535></code>	Authentication server response timeout in seconds (default 30 seconds).

Default No supplicant IP address for port authentication exists by default until first created with the **auth supplicant-ip** command. The parameter defaults are shown in the table above.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To add the supplicant IP address 192.168.10.0/24 to force authorized port control for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth supplicant-ip 192.168.10.0/24 port-
control force-authorized
```

To delete the supplicant IP address 192.168.10.0/24 for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth supplicant-ip 192.168.10.0/24
```

To disable reauthentication for the supplicant(s) IP address 192.168.10.0/24 for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth supplicant-ip 192.168.10.0/24
reauthentication
```

To add the supplicant IP address 192.168.10.0/24 to force authorized port control for auth profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth supplicant-ip 192.168.10.0/24
port-control force-authorized
```

Related commands

- [show auth](#)
- [show dot1x](#)
- [show dot1x interface](#)
- [show running-config](#)

Command changes Version 5.5.3-1.1: **max-req** parameter added

auth supplicant-mac

Overview This command adds a supplicant (client device) MAC address or MAC mask on a given interface with the parameters as specified in the table below.

Use the **no** variant of this command to delete the supplicant MAC address and reset other parameters to their default values.

Syntax `auth supplicant-mac <mac-addr> [mask <mac-addr-mask>] [max-reauth-req <1-10>] [max-req <1-10>] [port-control {auto|force-authorized|force-unauthorized|skip-second-auth}] [quiet-period <1-65535>] [reauthentication] [reauth-period <1-4294967295>] [supp-timeout <1-65535>] [server-timeout <1-65535>]`
`no auth supplicant-mac <mac-addr> [reauthentication]`

Parameter	Description
<code><mac-addr></code>	MAC (hardware) address of the supplicant entry in HHHH.HHHH.HHHH MAC address hexadecimal format.
<code>mask <mac-addr-mask></code>	A mask applied to MAC addresses in order to select only those addresses containing a specific string. The mask comprises a string of three (period separated) bytes, where each byte comprises four hexadecimal characters that will generally be either 1 or 0. When the mask is applied to a specific MAC address, a match is only required for characters that correspond to a 1 in the mask. Characters that correspond to a 0 in the mask are effectively ignored. In the examples section below, the mask <code>ffff.ff00.0000</code> is applied for the MAC address <code>0000.5E00.0000</code>. The applied mask will then match only those MAC addresses that begin with <code>0000.5E</code> (in this case the OUI component). The remaining portion of the addresses (in this case the NIC component) will be ignored.
<code>max-reauth-req <1-10></code>	Number of reauthentication attempts before becoming unauthorized (default 2).
<code>max-req <1-10></code>	Number of times the device resends an EAP Request packet if that packet is lost between the authenticating device and the specified supplicant (default 2, which is 3 transmission attempts in total). If the supplicant does not respond to an EAP Request after this number of retries, the supplicant fails the authentication process.
<code>port-control</code>	Port control options: auto: Allow port client to negotiate authentication force-authorized: Force port state to authorized force-unauthorized: Force port state to unauthorized skip-second-auth: Skip second authentication step.
<code>quiet-period <1-65535></code>	Quiet period in the HELD state in seconds (default 60 seconds).

Parameter	Description
reauthentication	Enable reauthentication on a port.
reauth-period <1-4294967295>	Seconds between reauthorization attempts (default 3600 seconds).
supp-timeout <1-65535>	Supplicant response timeout in seconds (default 30 seconds).
server-timeout <1-65535>	Authentication server response timeout in seconds (default 30 seconds).

Default No supplicant MAC address for port authentication exists by default until first created with the **auth supplicant-mac** command. The defaults for parameters are shown in the table above.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To add the supplicant MAC address 0000.5E00.5343 to force authorized port control for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth supplicant-mac 0000.5E00.5343 port-
control force-authorized
```

To apply the mask ffff.ff00.0000 in order to add any supplicant MAC addresses whose MAC address begins with 0000.5E, and then to force authorized port control for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth supplicant-mac 0000.5E00.0000 mask
ffff.ff00.0000 port-control force-authorized
```

To delete the supplicant MAC address 0000.5E00.5343 for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth supplicant-mac 0000.5E00.5343
```

To disable reauthentication for the supplicant MAC address 0000.5E00.5343 for interface port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface eth1
awplus(config-if)# no auth supplicant-mac 0000.5E00.5343
reauthentication
```

To add the supplicant MAC address 0000.5E00.5343 to force authorized port control for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth supplicant-mac 0000.5E00.5343
port-control force-authorized
```

To delete the supplicant MAC address 0000.5E00.5343 for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth supplicant-mac
0000.5E00.5343
```

Related commands

- [show auth](#)
- [show dot1x](#)
- [show dot1x interface](#)
- [show running-config](#)

Command changes Version 5.5.3-1.1: **max-req** parameter added

auth timeout connect-timeout

Overview Use this command to set the connect-timeout period for the interface.

Use the **no** variant of this command to reset the connect-timeout period to the default.

Syntax `auth timeout connect-timeout <1-65535>`
`no auth timeout connect-timeout`

Parameter	Description
<1-65535>	Specifies the connect-timeout period (in seconds).

Default The connect-timeout default is 30 seconds.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes This command is used for MAC and web authentication. If the connect-timeout has lapsed and the supplicant has the state **connecting**, then the supplicant is deleted. When **auth-web-server session-keep** or **auth two-step enable** is enabled, we recommend you configure a longer connect-timeout period.

Examples To set the connect-timeout period to 3600 seconds for port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth timeout connect-timeout 3600
```

To reset the connect-timeout period to the default (30 seconds) for port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth timeout connect-timeout
```

To set the connect-timeout period to 3600 seconds for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth timeout connect-timeout 3600
```

Related **auth profile (global)**
commands **show dot1x**
show dot1x interface

auth timeout quiet-period

Overview Use this command to set a time period for which another authentication request is not accepted on a given interface, after an authentication request has failed.

Use the **no** variant of this command to reset the quiet period to the default.

Syntax `auth timeout quiet-period <1-65535>`
`no auth timeout quiet-period`

Parameter	Description
<code><1-65535></code>	Specifies the quiet period (in seconds).

Default The quiet period for port authentication is 60 seconds.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the quiet period to 10 seconds for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth timeout quiet-period 10
```

To reset the quiet period to the default (60 seconds) for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth timeout quiet-period
```

To set the quiet period to 10 seconds for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth timeout quiet-period 10
```

Related commands [auth profile \(global\)](#)

auth timeout reauth-period

Overview Use this command to set the timer for reauthentication on a given interface. The re-authentication for the supplicant (client device) is executed at this timeout. The timeout is only applied if the **auth reauthentication** command is applied.

Use the **no** variant of this command to reset the **reauth-period** parameter to the default (3600 seconds).

Syntax auth timeout reauth-period <1-4294967295>
no auth timeout reauth-period

Parameter	Description
<1-4294967295>	The reauthentication timeout period (in seconds).

Default The default reauthentication period for port authentication is 3600 seconds, when reauthentication is enabled on the port.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the reauthentication period to 1 day for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth timeout reauth-period 86400
```

To reset the reauthentication period to the default (3600 seconds) for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth timeout reauth-period
```

To set the reauthentication period to 1 day for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth timeout reauth-period 86400
```

To reset the reauthentication period to the default (3600 seconds) for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth timeout reauth-period
```

Related commands

- auth profile (global)**
- auth reauthentication**
- show dot1x**
- show dot1x interface**
- show running-config**

auth timeout server-timeout

Overview Use this command to set the timeout for the waiting response from the RADIUS server on a given interface.

Use the **no** variant of this command to reset the server-timeout to the default (30 seconds).

Syntax `auth timeout server-timeout <1-65535>`
`no auth timeout server-timeout`

Parameter	Description
<code><1-65535></code>	Server timeout period (in seconds).

Default The server timeout for port authentication is 30 seconds.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the server timeout to 120 seconds for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth timeout server-timeout 120
```

To set the server timeout to the default (30 seconds) for interface port1.0.2 use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth timeout server-timeout
```

To set the server timeout to 120 seconds for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth timeout server-timeout 120
```

To set the server timeout to the default (30 seconds) for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth timeout server-timeout
```

Related **auth profile (global)**
commands **show dot1x**
show dot1x interface
show running-config

auth timeout supp-timeout

Overview This command sets the timeout of the waiting response from the supplicant (client device) on a given interface.

The **no** variant of this command resets the supplicant timeout to the default (30 seconds).

Syntax `auth timeout supp-timeout <1-65535>`
`no auth timeout supp-timeout`

Parameter	Description
<code><1-65535></code>	The supplicant timeout period (in seconds).

Default The supplicant timeout for port authentication is 30 seconds.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the supplicant timeout to 2 seconds for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth timeout supp-timeout 2
```

To reset the supplicant timeout to the default (30 seconds) for interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth timeout supp-timeout
```

To set the supplicant timeout to 2 seconds for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth timeout supp-timeout 2
```

Related commands [auth profile \(global\)](#)
[show dot1x](#)
[show dot1x interface](#)
[show running-config](#)

auth vlan-restriction

Overview Use this command to restrict port authenticated supplicants on an interface to one per VLAN. This is useful, for example, if you have configured multiple supplicants on an interface but you want to restrict network access to a single IP phone and a single authorized workstation.

Use the **no** variant of this command to remove the single supplicant per VLAN restriction.

Syntax `auth vlan-restriction`
`no auth vlan-restriction`

Default Not configured

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes This is a port authentication command, so you should first configure 802.1X, MAC, or web authentication. In addition, configure multi-supplicants on the interface using the **auth host-mode multi-supplicant** command.

This command works with both dynamic VLANs and static voice VLAN configurations.

Examples To restrict supplicants to a one per VLAN on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth vlan-restriction
```

To remove the one per VLAN supplicant restriction on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth vlan-restriction
```

Related commands

- auth dynamic-vlan-creation**
- auth host-mode**
- auth-mac enable**
- auth-web enable**
- dot1x port-control**
- show auth interface**
- show dot1x interface**
- switchport voice vlan**

Command changes Version 5.5.1-2.1: command added

auth two-step enable

Overview Use this command to enable a two-step authentication feature on an interface. When this feature is enabled, the supplicant is authorized in a two-step process. If authentication succeeds, the supplicant becomes authenticated.

Use this command to apply the two-step authentication method based on 802.1X, MAC or web authentication.

Use the **no** variant of this command to disable the two-step authentication feature.

Syntax auth two-step enable
no auth two-step enable

Default Two step authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage The single step authentication methods (either user or device authentication) have a potential security risk:

- an unauthorized user can access the network with an authorized device, or
- an authorized user can access the network with an unauthorized device.

Two-step authentication solves this problem by authenticating both the user and the device. The supplicant will only become authenticated if both these steps are successful. If the first authentication step fails, then the second step is not started.

Examples To enable the two step authentication feature, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth two-step enable
```

To disable the two step authentication feature, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth two-step enable
```

To enable MAC authentication followed by 802.1X authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access
awplus(config-if)# auth-mac enable
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# auth two-step enable
```

To enable MAC authentication followed by web authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access
awplus(config-if)# auth-mac enable
awplus(config-if)# auth-web enable
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# auth two-step enable
```

To enable 802.1X authentication followed by web authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth-web enable
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# auth two-step enable
```

To enable the two step authentication feature for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth two-step enable
```

Related Commands

- auth profile (global)**
- auth two-step order**
- show auth two-step supplicant brief**
- show auth**
- show auth interface**
- show auth supplicant**
- show dot1x**
- show dot1x interface**
- show dot1x supplicant**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

auth two-step order

Overview Use this command to configure the order for two-step authentication. Two-step authentication and the relevant authentication methods must be enabled on the interface.

Use the **no** variant of this command to reset the authentication order to the default.

Syntax `auth two-step order auth-mac {dot1x|auth-web}`
`auth two-step order dot1x {auth-mac|auth-web}`
`no auth two-step order`

Parameter	Description
auth-mac	MAC authentication
dot1x	802.1X authentication
auth-web	Web authentication

Default Order is determined by the authentication methods configured on the interface (see **Usage notes**).

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes The default authentication order depends on the combination of the authentication methods configured on the interface:

- If auth-mac is configured then auth-mac will be the first method.
- If auth-mac is **not** configured then dot1x will become the first method.
- If only two methods are configured then the remaining method becomes the second method.
- If all three methods are configured then the second method is chosen based on the packet type received (dot1x for an EAPOL packet and auth-web for an HTTP packet).

Examples To set the two-step authentication order on port1.0.1 for 802.1X authentication and then MAC authentication, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# switchport mode access
awplus(config-if)# auth-mac enable
awplus(config-if)# dot1x port-control auto
awplus(config-if)# auth two-step enable
awplus(config-if)# auth two-step order dot1x auth-mac
```

To reset the two-step authentication order back to the default, which would be MAC authentication then 802.1X authentication if configured as above, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no auth two-step order
```

Related commands

- auth two-step enable**
- auth-mac enable**
- auth-web enable**
- dot1x port-control**
- show auth interface**
- show auth supplicant**

Command changes Version 5.5.0-0.3: command added

auth-mac accounting

Overview Use this command to override the **default** RADIUS accounting method for MAC-based authentication on an interface by allowing you to apply a user-defined named list.

Use the **no** variant of this command to remove the named list from the interface and apply the **default** method.

Syntax `auth-mac accounting {default|<list-name>}`
`no auth-mac accounting`

Parameter	Description
default	Apply the default accounting method list
<list-name>	Apply the user-defined named list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_acct' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# auth-mac accounting vlan10_acct
```

To remove the named list from the vlan10 interface and set the accounting method back to **default**, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no auth-mac accounting
```

Related commands [aaa accounting auth-mac](#)

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac authentication

Overview This command overrides the **default** MAC authentication method on an interface by allowing you to apply a user-defined named list.

Use the **no** variant of this command to remove the named list from the interface and apply the **default** method.

Syntax `auth-mac authentication {default|<list-name>}`
`no auth-mac authentication`

Parameter	Description
default	Apply the default authentication method list
<list-name>	Apply a user-defined named list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_auth' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# auth-mac authentication vlan10_auth
```

To remove the named list from the vlan10 interface and set the authentication method back to **default**, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no auth-mac authentication
```

Related commands [aaa authentication auth-mac](#)

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac enable

Overview This command enables MAC authentication on the interface specified in the Interface command mode.

Use the **no** variant of this command to disable MAC authentication on an interface.

Syntax auth-mac enable
no auth-mac enable

Default MAC-Authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes Enabling **spanning-tree edgeport** on ports after enabling MAC authentication avoids unnecessary re-authentication when the port state changes, which does not happen when spanning tree edgeport is enabled. Note that re-authentication is correct behavior without **spanning-tree edgeport** enabled.

Applying **switchport mode access** on ports is also good practice to set the ports to access mode with ingress filtering turned on, whenever ports for MAC authentication are in a VLAN.

If you attempt to change the authentication configuration on an interface that has threat protection quarantine configured, you will see the following error message:

```
% portx.x.x: Application Proxy quarantine configuration must be removed before port authentication is changed
```

Before changing the interface's authentication configuration you must either:

- remove the interface's threat protection configuration, or
- shut down the interface.

Examples To enable MAC authentication on interface port1.0.2 and enable spanning tree edgeport to avoid unnecessary re-authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth-mac enable
awplus(config-if)# spanning-tree edgeport
awplus(config-if)# switchport mode access
```

To disable MAC authentication on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth-mac enable
```

To enable MAC authentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-mac enable
```

Related commands

- auth profile (global)**
- show auth**
- show auth interface**
- show running-config**

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac method

Overview This command sets the type of authentication method for MAC authentication that is used with RADIUS on the interface specified in the interface command mode.

The **no** variant of this command resets the authentication method used to the default method (PAP) as the RADIUS authentication method used by the MAC authentication.

Syntax `auth-mac method [eap-md5|pap]`
`no auth-mac method`

Parameter	Description
eap-md5	Enable EAP-MD5 as the authentication method.
pap	Enable PAP as the authentication method.

Default The MAC authentication method is PAP.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the MAC authentication method to PAP on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth-mac method pap
```

To set the MAC authentication method to the default on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth-mac method
```

To set the MAC authentication method to EAP-MD5 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-mac method eap-md5
```

Related commands **auth profile (global)**
show auth
show auth interface
show running-config

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac password

Overview This command changes the password for MAC-based authentication.
Use the **no** variant of this command to return the password to its default.

Syntax `auth-mac [encrypted] password <password>`
`no auth-mac password`

Parameter	Description
<code>auth-mac</code>	MAC-based authentication
<code>encrypted</code>	Specify an encrypted password
<code>password</code>	Configure the password
<code><password></code>	The new password. Passwords can be up to 64 characters in length and can contain any printable characters except: • ? • " (double quotes) • space

Default By default, the password is the MAC address of the supplicant.

Mode Global Configuration

Usage notes Changing the password increases the security of MAC-based authentication, because the default password is easy for an attacker to discover. This is particularly important if:

- some MAC-based supplicants on the network are intelligent devices, such as computers, and/or
- you are using two-step authentication (see the “Ensuring Authentication Methods Require Different Usernames and Passwords” section of the [AAA and Port Authentication Feature_Overview_and_Configuration_Guide](#)).

Examples To change the password to verySecurePassword, use the commands:

```
awplus# configure terminal
awplus(config)# auth-mac password verySecurePassword
```

Related commands [auth two-step enable](#)
[show auth](#)

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac reauth-relearning

Overview This command sets the MAC address learning of the supplicant (client device) to re-learning for re-authentication on the interface specified in the interface command mode.

Use the **no** variant of this command to disable the auth-mac re-learning option.

Syntax auth-mac reauth-relearning
no auth-mac reauth-relearning

Default Re-learning for port authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To enable the re-authentication re-learning feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth-mac reauth-relearning
```

To disable the re-authentication re-learning feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth-mac reauth-relearning
```

To enable the re-authentication re-learning feature on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-mac reauth-relearning
```

Related commands [auth profile \(global\)](#)
[show auth](#)
[show auth interface](#)
[show running-config](#)

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac static

Overview This command configures MAC authentication to use static entries in the FDB. Static entries persist in the FDB, even if there is no traffic flow from the supplicant.

When static FDB entries are configured, the **auth roaming disconnected** command is supported for MAC authentication. This command allows a supplicant to move to another authenticating interface without re-authentication.

Use the **no** variant of this command to revert to dynamic FDB entries.

Syntax `auth-mac static`
`no auth-mac static`

Default By default MAC authentication supplicants are added to the FDB dynamically.

Mode Global Configuration

Example To configure MAC authentication to use static FDB entries, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-mac static
```

To configure MAC authentication to use dynamic FDB entries, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-mac static
```

Related commands **auth roaming disconnected**
show auth
show dot1x

Command changes Version 5.4.7-2.4: Command added
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-mac username

Overview Use this command to specify the format of the MAC address in the username and password field when a request for MAC-based authorization is sent to a RADIUS server.

Syntax `auth-mac username {ietf|unformatted} {lower-case|upper-case}`

Parameter	Description
ietf	The MAC address includes a hyphen between each 2 bytes. (Example: xx-xx-xx-xx-xx-xx)
unformatted	The MAC address does not include hyphens. (Example: xxxxxxxxxxxx)
lower-case	The MAC address uses lower-case characters (a-f)
upper-case	The MAC address uses upper-case characters (A-F)

Default `auth-mac username ietf lower-case`

Mode Global Configuration

Usage This command is provided to allow other vendors', AlliedWare, and AlliedWare Plus switches to share the same format on the RADIUS server.

Example To configure the format of the MAC address in the username and password field to be changed to IETF and upper-case, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-mac username ietf upper-case
```

Related commands [auth-mac username](#)
[show running-config](#)

Command changes Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

auth-web accounting

Overview This command overrides the default RADIUS accounting method for web-based authentication on an interface by allowing you to apply a user-defined named list.

Use the **no** variant of this command to remove the named list from the interface and apply the default method.

Syntax `auth-web accounting {default|<list-name>}`
`no auth-web accounting`

Parameter	Description
default	Apply the default accounting method list
<list-name>	Apply a named accounting method list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_acct' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# auth-web accounting vlan10_acct
```

To remove the named list from the vlan10 interface and set the accounting method back to default, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no auth-web accounting
```

Related commands [aaa accounting auth-web](#)

auth-web authentication

Overview Use this command to override the default web-based authentication method on an interface by allowing you to apply a user-defined named list.

Use the **no** variant of this command to remove the named list from the interface and apply the default method.

Syntax `auth-web authentication {default|<list-name>}`
`no auth-web authentication`

Parameter	Description
default	Apply the default authentication method list
<list-name>	Apply the user-defined named list

Default The **default** method list is applied to an interface by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To apply the named list 'vlan10_auth' on the vlan10 interface, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# auth-web authentication vlan10_auth
```

To remove the named list from the vlan10 interface and set the authentication method back to default, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no auth-web authentication
```

Related commands [aaa authentication auth-web](#)

auth-web enable

Overview Use this command to enable web-based authentication in Interface mode on the interface specified.

Use the **no** variant of this command to apply its default.

Syntax auth-web enable
no auth-web enable

Default Web authentication is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes If you attempt to change the authentication configuration on an interface that has threat protection quarantine configured, you will see the following error message:

```
% portx.x.x: Application Proxy quarantine configuration must be removed before port authentication is changed
```

Before changing the interface's authentication configuration you must either:

- remove the interface's threat protection configuration, or
- shut down the interface.

Examples To enable web authentication on static-channel-group 2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# static-channel-group 2
awplus(config-if)# exit
awplus(config)# interface sa2
awplus(config-if)# auth-web enable
```

To disable web authentication on static-channel-group 2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface sa2
awplus(config-if)# no auth-web enable
```

To enable web authentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-web enable
```

To disable web authentication on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth-web enable
```

Related commands

- auth profile (global)**
- show auth**
- show auth interface**
- show running-config**

auth forward

Overview Use this command to enable the authentication packet forwarding feature on the interface specified. This command also enables ARP forwarding, and adds forwarded packets to the **tcp** or **udp** port number specified.

Use the **no** variant of this command to disable the specified packet forwarding feature on the interface.

Syntax `auth forward [<ip-address>|<ip-address/prefix-length>] {dns|tcp <1-65535>|udp <1-65535>}`

or

`auth forward {arp|dhcp|dns|tcp <1-65535>|udp <1-65535>}`

The **no** variants of this command are:

`no auth forward [<ip-address>|<ip-address/prefix-length>] {dns|tcp <1-65535>|udp <1-65535>}`

or

`no auth forward {arp|dhcp|dns|tcp <1-65535>|udp <1-65535>}`

Parameter	Description
<code><ip-address><ip-address/prefix-length></code>	The IP address or subnet on which the authentication is to be enabled.
<code>arp</code>	Enable forwarding of ARP.
<code>dhcp</code>	Enable forwarding of DHCP (67/udp).
<code>dns</code>	Enable forwarding of DNS (53/udp).
<code>tcp</code>	Enable forwarding of TCP specified port number.
<code><1-65535></code>	TCP Port number.
<code>udp</code>	Enable forwarding of UDP specified port number.
<code><1-65535></code>	UDP Port number.

Default Packet forwarding for port authentication is enabled by default for “arp”, “dhcp” and “dns”.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Usage notes For more information about the *<ip-address>* parameter, and an example, see the “auth forward” section in the **AlliedWare Plus Technical Tips and Tricks**.

Examples To enable the ARP forwarding feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth forward arp
```

To add TCP forwarding port 137 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth forward tcp 137
```

To add the DNS Server IP address 192.168.1.10 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# switchport mode access
awplus(config-if)# auth-web enable
awplus(config-if)# auth dynamic-vlan-creation
awplus(config-if)# auth forward 192.168.1.10 dns
```

To disable the ARP forwarding feature on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth forward arp
```

To delete TCP forwarding port 137 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth forward tcp 137
```

To delete all TCP forwarding on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth forward tcp
```

To enable the ARP forwarding feature on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth forward arp
```

To add TCP forwarding port 137 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth forward tcp 137
```

To disable the ARP forwarding feature on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth forward arp
```

To delete TCP forwarding port 137 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth forward tcp 137
```

To delete all TCP forwarding on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth forward tcp
```

Related commands [auth profile \(global\)](#)
[show auth](#)
[show auth interface](#)

Command changes Version 5.5.4-0.1: syntax changed from **auth-web forward** to **auth forward**

auth-web idle-timeout enable

Overview Use this command to enable the idle-timeout for client of web authentication on the interface.

The **no** variant of this command to disable the idle-timeout for client of web authentication on the interface.

Syntax auth-web idle-timeout enable
no auth-web idle-timeout enable

Default The idle-timeout is disabled by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To enable the idle-timeout on an interface, use the following commands:

```
awplus# configure terminal
awplus(config)# interface eth1
awplus(config)# auth-web enable
awplus(config-if)# auth-web idle-timeout enable
```

To disable the idle-timeout on an interface, use the following commands:

```
awplus# configure terminal
awplus(config)# interface eth1
awplus(config-if)# no auth-web idle-timeout enable
```

Related commands [auth-web enable](#)
[auth-web idle-timeout timeout](#)

auth-web idle-timeout timeout

Overview Use this command to set the timeout value for web authentication client in seconds. The client will be unauthorized when it does not have any activity for a period that exceeds the timeout value.

The **no** variant of this command sets the timeout value to the default setting, 3600 seconds.

Syntax `auth-web idle-timeout timeout <420-86400>`
`no auth-web idle-timeout timeout`

Parameter	Description
<code><420-86400></code>	Time in seconds.

Default The timeout is 3600 seconds by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To set 30 minutes as the idle-timeout, use the following commands:

```
awplus# configure terminal
awplus(config)# interface eth1
awplus(config-if)# auth-web idle-timeout timeout 1800
```

To return the idle-timeout to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# interface eth1
awplus(config-if)# no auth-web idle-timeout timeout
```

Related commands [auth-web enable](#)
[auth-web idle-timeout enable](#)

auth-web max-auth-fail

Overview Use this command to set the number of authentication failures allowed before rejecting further authentication requests. When the supplicant (client device) fails more than the specified number of times, then login requests are refused during the quiet period.

Use the **no** variant of this command to reset the maximum number of authentication failures to the default.

Syntax auth-web max-auth-fail <0-10>
no auth-web max-auth-fail

Parameter	Description
<0-10>	The maximum number of authentication failures allowed before login requests are refused.

Default The maximum number of authentication failures is set to 3.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Examples To set the lock count to 5 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth-web max-auth-fail 5
```

To set the lock count to the default on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no auth-web max-auth-fail
```

To set the lock count to 5 on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-web max-auth-fail 5
```

To set the lock count to the default on authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no auth-web max-auth-fail
```

Related commands

- auth profile (global)**
- auth timeout quiet-period**
- show auth**
- show auth interface**
- show running-config**

auth-web method

Overview Use this command to set the web authentication access method that is used with RADIUS on the interface specified.

Use the **no** variant of this command to set the authentication method to PAP for the interface specified when web authentication is also used with the RADIUS authentication method.

Syntax `auth-web method {eap-md5|pap}`
`no auth-web method`

Parameter	Description
eap-md5	Enable EAP-MD5 as the authentication method.
pap	Enable PAP as the authentication method.

Default The web authentication method is set to PAP by default.

Mode Interface Configuration for a static channel, a dynamic (LACP) channel group, or a switch port; or Authentication Profile mode.

Example To set the web authentication method to EAP-MD5 on interface port1.0.2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# auth-web method eap-md5
```

To set the web authentication method to EAP-MD5 for authentication profile 'student', use the commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# auth-web method eap-md5
```

Related commands [auth profile \(global\)](#)
[show auth](#)
[show auth interface](#)
[show running-config](#)

auth-web-server blocking-mode

Overview Use this command to enable blocking mode for the Web-Authentication server. The blocking mode displays an authentication success or failure screen immediately from the response result from a RADIUS server.

Use the **no** variant of this command to disable blocking mode for the Web-Authentication server.

Syntax `auth-web-server blocking-mode`
`no auth-web-server blocking-mode`

Default By default, blocking mode is disabled for the Web-Authentication server.

Mode Global Configuration

Example To enable blocking mode for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server blocking-mode
```

To disable blocking mode for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server blocking-mode
```

Related commands [**auth-web-server redirect-delay-time**](#)
[**show auth-web-server**](#)
[**show running-config**](#)

auth-web-server dhcp ipaddress

Overview Use this command to assign an IP address and enable the DHCP service on the Web-Authentication server for supplicants (client devices).

Use the **no** variant of this command to remove an IP address and disable the DHCP service on the Web-Authentication server for supplicants.

Syntax `auth-web-server dhcp ipaddress <ip-address/prefix-length>`
`no auth-web-server dhcp ipaddress`

Parameter	Description
<code><ip-address/prefix-length></code>	The IPv4 address and prefix length assigned for the DHCP service on the Web-Authentication server for supplicants.

Default No IP address for the Web-Authentication server is set by default.

Mode Global Configuration

Usage notes See the [AAA and Port Authentication Feature Overview and Configuration Guide](#) for information about:

- using DHCP with web authentication, and
- restrictions regarding combinations of authentication enhancements working together

You cannot use the IPv4 address assigned to the device's interface as the Web-Authentication server address.

Note that this Web Authentication virtual DHCP server is a limited implementation of the DHCP protocol. Separation of IP addresses depends on allocating addresses incrementally and a short lease time. In a situation where a supplicant remains permanently connected but does not authenticate, there is a risk of re-allocation of the same IP address once the server has rolled through the entire address range.

Examples To assign the IP address 10.0.0.1 to the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server dhcp ipaddress 10.0.0.1/8
```

To remove an IP address on the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server dhcp ipaddress
```

Related commands **auth-web-server dhcp lease**
show auth-web-server
show running-config

auth-web-server dhcp lease

Overview Use this command to set the DHCP lease time for supplicants (client devices) using the DHCP service on the Web-Authentication server.

Use the **no** variant of this command to reset to the default DHCP lease time for supplicants using the DHCP service on the Web-Authentication server.

Syntax `auth-web-server dhcp lease <20-60>`
`no auth-web-server dhcp lease`

Parameter	Description
<code><20-60></code>	DHCP lease time for supplicants using the DHCP service on the Web- Authentication server in seconds.

Default The default DHCP lease time for supplicants using the DHCP service on the Web- Authentication server is set to 30 seconds.

Mode Global Configuration

Usage notes See the [AAA and Port Authentication Feature Overview and Configuration Guide](#) for information about:

- using DHCP with web authentication, and
- restrictions regarding combinations of authentication enhancements working together

Examples To set the DHCP lease time to 1 minute for supplicants using the DHCP service on the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server dhcp lease 60
```

To reset the DHCP lease time to the default setting (30 seconds) for supplicants using the DHCP service on the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server dhcp lease
```

Validation Commands [show running-config](#)

Related commands [show auth-web-server](#)
[auth-web-server dhcp ipaddress](#)

auth-web-server dhcp-wpad-option

Overview This command sets the DHCP WPAD (Web Proxy Auto-Discovery) option for the Web-Authentication temporary DHCP service.

For more information and examples, see the “Web Auth Proxy” section in the [AlliedWare Plus Technical Tips and Tricks](#).

Use the **no** variant of this command to disable the DHCP WPAD function.

Syntax auth-web-server dhcp wpad-option <url>
no auth-web-server dhcp wpad-option

Parameter	Description
<url>	URL to the server which gets a .pac file.

Default The Web-Authentication server DHCP WPAD option is not set.

Mode Global Configuration

Usage notes If the supplicant is configured to use WPAD, the supplicant’s web browser will use TCP port 80 as usual. Therefore, the packet can be intercepted by Web-Authentication as normal, and the Web-Authentication Login page can be sent. However, after authentication, the browser does not know where to get the WPAD file and so cannot access external web pages. The WPAD file is usually named proxy.pac file and tells the browser what web proxy to use.

Use this command to tell the supplicant where it can get this file from. The switch itself can be specified as the source for this file, and it can deliver it to the supplicant on request.

Example To specify that the proxy.pac file is found on the server at 192.168.1.100, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server dhcp wpad-option
http://192.168.1.100/proxy/proxy.pac
```

Related commands [show auth-web-server](#)

auth-web-server host-name

Overview This command assigns a hostname to the web authentication server.

Use the **no** variant of this command to remove the hostname from the web authentication server.

Syntax auth-web-server host-name <hostname>
no auth-web-server host-name

Parameter	Description
<hostname>	URL string of the hostname

Default The web authentication server has no hostname.

Mode Global Configuration

Usage notes When the web authentication server uses HTTPS protocol, the web browser will validate the certificate. If the certificate is invalid, the web page gives a warning message before displaying server content. However, the web page will not give warning message if the server has a hostname same as the one stored in the installed certificate.

Examples To set the auth.example.com as the hostname of the web authentication server, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# auth-web-server host-name auth.example.com
```

To remove hostname auth.example.com from the web authentication server, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no auth-web-server host-name
```

Related commands [aaa authentication auth-web](#)
[auth-web enable](#)

auth-web-server intercept-port

Overview This command specifies any additional TCP port numbers that the Web-Authentication server is to intercept.

Use the **no** variant of this command to stop intercepting the TCP port numbers.

Syntax `auth-web-server intercept-port {<1-65535>|any}`
`no auth-web-server intercept-port {<1-65535>|any}`

Parameter	Description
<1-65535>	TCP port number.
any	Intercept all TCP packets

Default No additional TCP port numbers are intercepted by default.

Mode Global Configuration

Usage notes If this command is not specified, AlliedWare Plus Web-Authentication intercepts the supplicant's initial TCP port 80 connection to a web page and sends it the Web-Authentication Login page. However, if the supplicant is configured to use a web proxy, then it will usually be using TCP port 8080 (or another user configured port number). In this case Web-Authentication cannot intercept the connection.

To overcome this limitation you can use this command to tell the switch which additional port it should intercept, and then send the Web-Authentication Login page to the supplicant.

When the web authentication switch is in a guest network, the switch does not know the proxy server's port number in the supplicant's proxy setting. To overcome this limitation, you can use the **any** option in this command to intercept all TCP packets.

When you use this command in conjunction with a proxy server configured in the web browser, you must add the proxy server's network as a 'No Proxy' network. You can specify 'No Proxy' networks in the proxy settings in your web browser. For more information, see the "Web Auth Proxy" section in the [Alliedware Plus Technical Tips and Tricks](#).

Example To additionally intercept port number 3128, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server intercept-port 3128
```

Related [show auth-web-server commands](#)

auth-web-server ip-conflict-prefer-newer-supPLICANT

Overview Use this command to alter the behavior of a Network Access Server (NAS) when it detects a supplicant with a duplicate IP address.

The default behavior is for the NAS to not authorize the newer supplicant. This command allows it to authorize the newer supplicant and unauthorize the original supplicant.

This command applies to Web-based authentication supplicants only.

Use the **no** variant of this command to set the behavior back to default.

Syntax `auth-web-server ip-conflict-prefer-newer-supPLICANT`
`no auth-web-server ip-conflict-prefer-newer-supPLICANT`

Default The default behavior is to not authorize the newer supplicant if the NAS detects a duplicate IP address.

Mode Global Configuration

Usage notes Allied Telesis recommends you investigate and resolve the root cause of the conflicting IP addresses.

Example To configure a NAS to authorize the newer supplicant, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ip-conflict-prefer-newer-supPLICANT
```

Related commands [auth-web enable](#)
[show auth](#)

Command changes Version 5.5.2-0.1: command added

auth-web-server ipaddress

Overview This command sets the IP address for the Web-Authentication server.

Use the **no** variant of this command to delete the IP address for the Web-Authentication server.

You cannot use the IPv4 address assigned to the device's interface as the Web-Authentication server address.

Syntax `auth-web-server ipaddress <ip-address>`
`no auth-web-server ipaddress`

Parameter	Description
<code><ip-address></code>	Web-Authentication server dotted decimal IP address in A.B.C.D format.

Default The Web-Authentication server address on the system is not set by default.

Mode Global Configuration

Examples To set the IP address 10.0.0.1 to the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ipaddress 10.0.0.1
```

To delete the IP address from the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server ipaddress
```

Validation `show auth`
Commands `show auth-web-server`
`show running-config`

auth-web-server page language

Overview Use this command to set the presentation language of Web authentication pages. Titles and subtitles of Web authentication pages will be set accordingly. Note that presently only English or Japanese are offered.

Use the **no** variant of this command to set the presentation language of Web authentication pages to its default (English).

Syntax auth-web-server page language {english|japanese}
no auth-web-server page language

Parameter	Description
english	Web authentication pages are presented in English.
japanese	Web authentication pages are presented in Japanese.

Default Web authentication pages are presented in English by default.

Mode Global Configuration

Examples To set Japanese as the presentation language of Web authentication pages, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page language japanese
```

To set English as the presentation language of Web authentication pages, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page language english
```

To unset the presentation language of Web authentication pages and use English as the default presentation language, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server page language
```

Related commands [auth-web-server page title](#)
[auth-web-server page sub-title](#)
[show auth-web-server page](#)

auth-web-server login-url

Overview This command sets the web-authentication login page URL. This lets you replace the login page with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#) for details.

Use the **no** variant of this command to delete the URL.

Syntax `auth-web-server login-url <URL>`
`no auth-web-server login-url`

Parameter	Description
<URL>	Set login page URL

Default The built-in login page is set by default.

Mode Global Configuration

Examples To set `http://example.com/login.html` as the login page, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server login-url http://example.com/login.html
```

To unset the login page URL, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server login-url
```

Related commands [show running-config](#)

auth-web-server page logo

Overview This command sets the type of logo that will be displayed on the web authentication page.

Use the **no** variant of this command to set the logo type to **auto**.

Note that if you need to customize the login page extensively, you can instead replace it with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Syntax `auth-web-server page logo {auto|default|hidden}`
`no auth-web-server page logo`

Parameter	Description
auto	Display the custom logo if installed; otherwise display the default logo
default	Display the default logo
hidden	Hide the logo

Default Logo type is **auto** by default.

Mode Global Configuration

Examples To display the default logo with ignoring installed custom logo, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page logo default
```

To set back to the default logo type **auto**, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server page logo
```

Validation Commands [show auth-web-server page](#)

auth-web-server page sub-title

Overview This command sets the custom sub-title on the web authentication page.

Use the **no** variant of this command to reset the sub-title to its default.

Note that if you need to customize the login page extensively, you can instead replace it with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Syntax `auth-web-server page sub-title {hidden|text <sub-title>}`
`no auth-web-server page sub-title`

Parameter	Description
hidden	Hide the sub-title
<sub-title>	Text string of the sub-title

Default “Allied-Telesis” is displayed by default.

Mode Global Configuration

Examples To set the custom sub-title, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page sub-title text Web
Authentication
```

To hide the sub-title, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page sub-title hidden
```

To change back to the default title, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server page sub-title
```

Validation Commands [show auth-web-server page](#)

auth-web-server page success-message

Overview This command sets the success message on the web-authentication page.

Use the **no** variant of this command to remove the success message.

Note that if you need to customize the login page extensively, you can instead replace it with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Syntax auth-web-server page success-message text <success-message>
no auth-web-server page success-message

Parameter	Description
<success-message>	Text string of the success message

Default No success message is set by default.

Mode Global Configuration

Examples To set the success message on the web-authentication page, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# auth-web-server page success-message text Your  
success message
```

To unset the success message on the web-authentication page, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no auth-web-server page success-message
```

Validation Commands [show auth-web-server page](#)

auth-web-server page title

Overview This command sets the custom title on the web authentication page.

Use the **no** variant of this command to remove the custom title.

Note that if you need to customize the login page extensively, you can instead replace it with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Syntax auth-web-server page title {hidden|text <title>}
no auth-web-server page title

Parameter	Description
hidden	Hide the title
<title>	Text string of the title

Default “Web Access Authentication Gateway” is displayed by default.

Mode Global Configuration

Examples To set the custom title on the web authentication page, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page title text Login
```

To hide the title on the web authentication page, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server page title hidden
```

To unset the custom title on the web authentication page, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server page title
```

Validation Commands [show auth-web-server page](#)

auth-web-server page welcome-message

Overview This command sets the welcome message on the web-authentication login page.

Use the **no** variant of this command to remove the welcome message.

Note that if you need to customize the login page extensively, you can instead replace it with your own page. See “Customising the Login Page” in the [AAA and Port Authentication Feature Overview and Configuration Guide](#).

Syntax auth-web-server page welcome-message text <welcome-message>
no auth-web-server page welcome-message

Parameter	Description
<welcome-message>	Text string of the welcome message

Default No welcome message is set by default.

Mode Global Configuration

Examples To set the welcome message on the web-authentication page, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# auth-web-server page welcome-message text Your  
welcome message
```

To remove the welcome message on the web-authentication page, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no auth-web-server page welcome-message
```

Validation Commands [show auth-web-server page](#)

auth-web-server ping-poll enable

Overview This command enables the ping polling to the supplicant (client device) that is authenticated by Web-Authentication.

The **no** variant of this command disables the ping polling to the supplicant that is authenticated by Web-Authentication.

Syntax auth-web-server ping-poll enable
no auth-web-server ping-poll enable

Default The ping polling feature for Web-Authentication is disabled by default.

Mode Global Configuration

Examples To enable the ping polling feature for Web-Authentication, use the following commands:

```
awplus# configure terminal  
awplus(config)# auth-web-server ping-poll enable
```

To disable the ping polling feature for Web-Authentication, use the following commands:

```
awplus# configure terminal  
awplus(config)# no auth-web-server ping-poll enable
```

Validation Commands **show auth**
show auth-web-server
show running-config

auth-web-server ping-poll failcount

Overview This command sets a fail count for the ping polling feature when used with Web-Authentication. The **failcount** parameter specifies the number of unanswered pings. A supplicant (client device) is logged off when the number of unanswered pings are greater than the failcount set with this command.

Use the **no** variant of this command to resets the fail count for the ping polling feature to the default (5 pings).

Syntax `auth-web-server ping-poll failcount <1-100>`
`no auth-web-server ping-poll failcount`

Parameter	Description
<code><1-100></code>	Count.

Default The default failcount for ping polling is 5 pings.

Mode Global Configuration

Examples To set the failcount of ping polling to 10 pings, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# auth-web-server ping-poll failcount 10
```

To set the failcount of ping polling to default, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no auth-web-server ping-poll failcount
```

Validation Commands `show auth`
`show auth-web-server`
`show running-config`

auth-web-server ping-poll interval

Overview This command is used to change the ping poll interval. The interval specifies the time period between pings when the supplicant (client device) is reachable.

Use the **no** variant of this command to reset to the default period for ping polling (30 seconds).

Syntax auth-web-server ping-poll interval <1-65535>
no auth-web-server ping-poll interval

Parameter	Description
<1-65535>	Seconds.

Default The interval for ping polling is 30 seconds by default.

Mode Global Configuration

Examples To set the interval of ping polling to 60 seconds, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# auth-web-server ping-poll interval 60
```

To set the interval of ping polling to the default (30 seconds), use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no auth-web-server ping-poll interval
```

Validation Commands **show auth**
show auth-web-server
show running-config

auth-web-server ping-poll reauth-timer-refresh

Overview This command modifies the **reauth-timer-refresh** parameter for the Web-Authentication feature. The **reauth-timer-refresh** parameter specifies whether a re-authentication timer is reset and when the response from a supplicant (a client device) is received.

Use the **no** variant of this command to reset the **reauth-timer-refresh** parameter to the default setting (disabled).

Syntax auth-web-server ping-poll reauth-timer-refresh
no auth-web-server ping-poll reauth-timer-refresh

Default The reauth-timer-refresh parameter is disabled by default.

Mode Global Configuration

Examples To enable the reauth-timer-refresh timer, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ping-poll reauth-timer-refresh
```

To disable the reauth-timer-refresh timer, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server ping-poll reauth-timer-refresh
```

Validation Commands **show auth**
show auth-web-server
show running-config

auth-web-server ping-poll timeout

Overview This command modifies the ping poll **timeout** parameter for the Web-Authentication feature. The **timeout** parameter specifies the time in seconds to wait for a response to a ping packet.

Use the **no** variant of this command to reset the timeout of ping polling to the default (1 second).

Syntax `auth-web-server ping-poll timeout <1-30>`
`no auth-web-server ping-poll timeout`

Parameter	Description
<1-30>	Seconds.

Default The default timeout for ping polling is 1 second.

Mode Global Configuration

Examples To set the timeout of ping polling to 2 seconds, use the command:

```
awplus# configure terminal
awplus(config)# auth-web-server ping-poll timeout 2
```

To set the timeout of ping polling to the default (1 second), use the command:

```
awplus# configure terminal
awplus(config)# no auth-web-server ping-poll timeout
```

Validation `show auth`
Commands `show auth-web-server`
`show running-config`

auth-web-server ping-poll type

Overview Use this command to set the type of polling used to check that a web authenticated supplicant is still connected. The polling can be done using either ICMP (ping), or ARP messages.

If there is a firewall between an authenticating server and a supplicant, it may block ICMP traffic. If this occurs try changing to ARP polling.

Polling only starts when ping-polling is enabled and the supplicant has been authorized.

Use the **no** variant of this command to set the default polling type of ICMP (ping).

Syntax auth-web-server ping-poll type {arp|ping}
no auth-web-server ping-poll type

Parameter	Description
auth-web-server	Web authentication server configuration commands
arp	Enable polling via ARP
ping	Enable polling via ICMP (ping)

Default ICMP

Mode Global Configuration

Examples To set the polling type to ARP, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ping-poll enable
awplus(config)# auth-web-server ping-poll type arp
```

To set the polling type to ICMP, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ping-poll enable
awplus(config)# auth-web-server ping-poll type ping
```

To set the polling type to the default, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server ping-poll type
```

Related commands **auth-web-server ping-poll enable**
auth-web-server ping-poll failcount
auth-web-server ping-poll interval
auth-web-server ping-poll reauth-timer-refresh
auth-web-server ping-poll timeout
show auth-web-server

Command changes Version 5.5.1-1.1: command added

auth-web-server port

Overview This command sets the HTTP port number for the Web-Authentication server.

Use the **no** variant of this command to reset the HTTP port number to the default (80).

Syntax `auth-web-server port <port-number>`
`no auth-web-server port`

Parameter	Description
<code><port-number></code>	Set the local Web-Authentication server port within the TCP port number range 1 to 65535.

Default The Web-Authentication server HTTP port number is set to 80 by default.

Mode Global Configuration

Examples To set the HTTP port number 8080 for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server port 8080
```

To reset to the default HTTP port number 80 for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server port
```

Validation Commands `show auth`
`show auth-web-server`
`show running-config`

auth-web-server redirect-delay-time

Overview Use this command to set the delay time in seconds before redirecting the supplicant to a specified URL when the supplicant is authorized.

Use the variant **no** to reset the delay time set previously.

Syntax `auth-web-server redirect-delay-time <5-60>`
`no auth-web-server redirect-delay-time`

Parameter	Description
<code>redirect-delay-time</code>	Set the delay time before jumping to a specified URL after the supplicant is authorized.
<code><5-60></code>	The time in seconds.

Default The default redirect delay time is 5 seconds.

Mode Global Configuration

Examples To set the delay time to 60 seconds for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server redirect-delay-time 60
```

To reset the delay time, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server redirect-delay-time
```

Related commands [auth-web-server blocking-mode](#)
[auth-web-server redirect-url](#)
[show auth-web-server](#)
[show running-config](#)

auth-web-server redirect-url

Overview This command sets a URL for supplicant (client device) authentication. When a supplicant is authorized it will be automatically redirected to the specified URL. Note that if the http redirect feature is used then this command is ignored.

Use the **no** variant of this command to delete the URL string set previously.

Syntax auth-web-server redirect-url <url>
no auth-web-server redirect-url

Parameter	Description
<url>	URL (hostname or dotted IP notation).

Default The redirect URL for the Web-Authentication server feature is not set by default (null).

Mode Global Configuration

Examples To enable and set redirect a URL string www.alliedtelesis.com for the Web-Authentication server, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server redirect-url http://
www.alliedtelesis.com
```

To delete a redirect URL string, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server redirect-url
```

Related commands [auth-web-server redirect-delay-time](#)
[show auth](#)
[show auth-web-server](#)
[show running-config](#)

auth-web-server session-keep

Overview This command enables the session-keep feature to jump to the original URL after being authorized by Web-Authentication.

Use the **no** variant of this command to disable the session keep feature.

Syntax `auth-web-server session-keep`
`no auth-web-server session-keep`

Default The session-keep feature is disabled by default.

Mode Global Configuration

Usage notes This function doesn't ensure to keep session information in all cases. Authenticated supplicant may be redirected to unexpected page when session-keep is enabled. This issue occurred by supplicant sending HTTP packets automatically after authentication page is displayed and the URL is written.

Examples To enable the session-keep feature, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server session-keep
```

To disable the session-keep feature, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server session-keep
```

Validation `show auth`
Commands `show auth-web-server`
`show running-config`

auth-web-server ssl

Overview This command enables HTTPS functionality for the Web-Authentication server feature.

Use the **no** variant of this command to disable HTTPS functionality for the Web-Authentication server.

Syntax `auth-web-server ssl`
`no auth-web-server ssl`

Default HTTPS functionality for the Web-Authentication server feature is disabled by default.

Mode Global Configuration

Examples To enable HTTPS functionality for the Web-Authentication server feature, use the following commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ssl
```

To disable HTTPS functionality for the Web-Authentication server feature, use the following commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server ssl
```

Validation Commands `show auth`
`show auth-web-server`
`show running-config`

auth-web-server ssl intercept-port

Overview Use this command to register HTTPS intercept port numbers when the HTTPS server uses custom port number (not TCP port number 443).

Note that you need to use the **auth-web-server intercept-port** command to register HTTP intercept port numbers.

Use the **no** variant of this command to delete registered port number.

Syntax `auth-web-server ssl intercept-port <1-65535>`
`no auth-web-server ssl intercept-port <1-65535>`

Parameter	Description
<1-65535>	TCP port number in the range from 1 through 65535

Default 443/TCP is registered by default.

Mode Global Configuration

Examples To register HTTPS port number 3128, use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server ssl intercept-port 3128
```

To delete HTTPS port number 3128, use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server ssl intercept-port 3128
```

Validation Commands **show auth-web-server**

Related commands **auth-web-server intercept-port**

auth-web-server trustpoint

Overview Use this command to set the PKI trustpoint to use for secure web authentication communication to an AlliedWare Plus device.

Use the **no** variant of this command to revert to using the default trustpoint 'default-selfsigned'.

Syntax `auth-web-server trustpoint <trustpoint-name>`
`no auth-web-server trustpoint`

Parameter	Description
<code><trustpoint-name></code>	Name of trustpoint

Default By default, web authentication uses the 'default-selfsigned' trustpoint.

Mode Global Configuration

Usage notes Before using the **auth-web-server trustpoint** command you will need to establish a trustpoint. For example, you can create a local self-signed trustpoint using the procedure outlined below.

Create a self-signed trustpoint called 'web-trust' with keypair 'web_key':

```
awplus# configure terminal
awplus(config)# crypto pki trustpoint web-trust
awplus(ca-trustpoint)# enrollment selfsigned
awplus(ca-trustpoint)# rsakeypair web_key
awplus(ca-trustpoint)# exit
awplus(config)# exit
```

Create the root and server certificates for this trustpoint:

```
awplus# crypto pki authenticate web-trust
awplus# crypto pki enroll web-trust
```

For more information about the AlliedWare Plus implementation of Public Key Infrastructure (PKI), see the [Public Key Infrastructure \(PKI\) Feature Overview and Configuration Guide](#)

Example To configure web authentication to use the trustpoint 'web-trust', use the commands:

```
awplus# configure terminal
awplus(config)# auth-web-server trustpoint web-trust
```

To configure web authentication to use the default trustpoint 'default-selfsigned', use the commands:

```
awplus# configure terminal
awplus(config)# no auth-web-server trustpoint
```

Related commands

- [crypto pki trustpoint](#)
- [show crypto pki certificates](#)
- [show crypto pki trustpoint](#)

Command changes Version 5.5.1-2.1: command added

copy proxy-autoconfig-file

Overview Use this command to download the proxy auto configuration (PAC) file to your switch. The Web-Authentication supplicant can get the downloaded file from the system web server.

Syntax copy <filename> proxy-autoconfig-file

Parameter	Description
<filename>	The URL of the PAC file.

Mode Privileged Exec

Example To download the PAC file to this device, use the command:

```
awplus# copy tftp://server/proxy.pac proxy-autoconfig-file
```

Related commands [show proxy-autoconfig-file](#)
[erase proxy-autoconfig-file](#)

copy web-auth-https-file

Overview Use this command to download the SSL server certificate for web-based authentication. The file must be in PEM (Privacy Enhanced Mail) format, and contain the private key and the server certificate.

Syntax copy <filename> web-auth-https-file

Parameter	Description
<filename>	The URL of the server certificate file.

Mode Privileged Exec

Example To download the server certificate file `verisign_cert.pem` from the TFTP server directory `server`, use the command:

```
awplus# copy tftp://server/verisign_cert.pem web-auth-https-file
```

Related commands

- [auth-web-server ssl](#)
- [erase web-auth-https-file](#)
- [show auth-web-server](#)

description (auth-profile)

Overview Use this command to add a description to an authentication profile in Authentication Profile mode.

Use the **no** variant of this command to remove the current description.

Syntax `description <description>`

Parameter	Description
<code><description></code>	Text describing the selected authentication profile.

Default No description configured by default.

Mode Authentication Profile

Example To add a description to the authentication profile 'student', use the following commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# description student room setting
```

To remove a description from the authentication profile 'student', use the following commands:

```
awplus# configure terminal
awplus(config)# auth profile student
awplus(config-auth-profile)# no description
```

Related commands [auth profile \(global\)](#)

erase proxy-autoconfig-file

Overview Use this command to remove the proxy auto configuration file.

Syntax erase proxy-autoconfig-file

Mode Privileged Exec

Example To remove the proxy auto configuration file, use the command:

```
awplus# erase proxy-autoconfig-file
```

Related commands [show proxy-autoconfig-file](#)
[copy proxy-autoconfig-file](#)

erase web-auth-https-file

Overview Use this command to remove the SSL server certificate for web-based authentication.

Syntax erase web-auth-https-file

Mode Privileged Exec

Example To remove the SSL server certificate file for web-based authentication use the command:

```
awplus# erase web-auth-https-file
```

Related commands

- [auth-web-server ssl](#)
- [copy web-auth-https-file](#)
- [show auth-web-server](#)

show auth

Overview This command shows the configuration state of authentication.

Syntax show auth [all]

Parameter	Description
all	Display all authentication information for each authenticated interface. This can be a static channel (or static aggregator), or a dynamic (or LACP) channel group, or a switch port.

Mode Privileged Exec

Example To display all authentication information, enter the command:

```
awplus# show auth all
```

Output The following shows typical output.

Example output from the show auth command

```
awplus# show auth all
802.1X Port-Based Authentication Enabled
MAC-based Port Authentication Disabled
WEB-based Port Authentication Enabled
  RADIUS server address (auth): 150.87.17.192:1812
  Last radius message id: 4
Authentication Info for interface port1.0.1
portEnabled: true - portControl: Auto
portStatus: Authorized
reAuthenticate: disabled
reAuthPeriod: 3600
PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
BE: supTimeout: 30 - serverTimeout: 30
CD: adminControlledDirections: in
KT: keyTxEnabled: false
critical: disabled
guestVlan: disabled
authFailVlan: disabled
dynamicVlanCreation: disabled
multiVlanCreation: disabled
hostMode: single-host
dot1x: enabled
  protocolVersion: 1
authMac: disabled
authWeb: enabled
  method: PAP
  maxAuthFail: 3
  packetForwarding:
    10.0.0.1 80/tcp
    dns
    dhcp

twoStepAuthentication:
  configured: enabled
  actual: enabled
supplicantMac: none
Supplicant name: oha
Supplicant address: 000d.6013.5398
  authenticationMethod: WEB-based Authentication
  Two-Step Authentication:
    firstAuthentication: Pass - Method: dot1x
    secondAuthentication: Pass - Method: web
portStatus: Authorized - currentId: 3
abort:F fail:F start:F timeout:F success:T
PAE: state: Authenticated - portMode: Auto
PAE: reAuthCount: 0 - rxRespId: 0
PAE: quietPeriod: 60 - maxReauthReq: 2
BE: state: Idle - reqCount: 0 - idFromServer: 2
CD: adminControlledDirections: in - operControlledDirections: in
CD: bridgeDetected: false
KR: rxKey: false
KT: keyAvailable: false - keyTxEnabled: false
```

Related [show dot1x](#)
commands

show auth diagnostics

Overview This command shows authentication diagnostics, optionally for the specified interface, which may be a static channel (or static aggregator) or a dynamic (or LACP) channel group or a switch port.

If no interface is specified then authentication diagnostics are shown for all interfaces.

Syntax show auth diagnostics [interface <interface-list>]

Parameter	Description
interface	Specify ports to show.
<interface-list>	The interfaces or ports to configure. An interface-list can be: • an interface (e.g. vlan2), a switch port (e.g. port1.0.6), a static channel group (e.g. sa2) or a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces, ports, static channel groups or dynamic (LACP) channel groups separated by a hyphen; e.g. vlan2-8, or port1.0.1-1.0.4, or sa1-2, or po1-2 • a comma-separated list of the above; e.g. port1.0.1, port1.0.4-1.0.6. Do not mix interface types in a list The specified interfaces must exist.

Mode Privileged Exec

Example To display authentication diagnostics for port1.0.6, enter the command:

```
awplus# show auth diagnostics interface port1.0.6
```

Output The following shows typical output.

Example output from the show auth diagnostics command

```
Authentication Diagnostics for interface port1.0.6
  Supplicant address: 00d0.59ab.7037
    authEnterConnecting: 2
    authEaplogoffWhileConnecting: 1
    authEnterAuthenticating: 2
    authSuccessWhileAuthenticating: 1
    authTimeoutWhileAuthenticating: 1
    authFailWhileAuthenticating: 0
    authEapstartWhileAuthenticating: 0
    authEaplogoggWhileAuthenticating: 0
    authReauthsWhileAuthenticated: 0
    authEapstartWhileAuthenticated: 0
    authEaplogoffWhileAuthenticated: 0
    BackendResponses: 2
    BackendAccessChallenges: 1
    BackendOtherrequestToSupplicant: 3
    BackendAuthSuccess: 1
```

Related commands [show dot1x interface](#)

show auth interface

Overview This command shows the status of port authentication on the specified interface.

Syntax show auth interface *<interface-list>*

Parameter	Description
<i><interface-list></i>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Example To display the web-based authentication status for port1.0.4, enter the command:

```
awplus# show auth interface port1.0.4
```

If port-based authentication is not configured, the output will be

```
% Port-Control not configured on port1.0.4
```

To display the port-based authentication status for port1.0.4, enter the command:

```
awplus# show auth interface port1.0.4
```

Example output from the show auth interface command

```
awplus# show auth interface port1.0.4
Authentication Info for interface port1.0.4
portEnabled: true - portControl: Auto
portStatus: Authorized
reAuthenticate: disabled
reAuthPeriod: 3600
PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
BE: suppTimeout: 30 - serverTimeout: 30
CD: adminControlledDirections: in
KT: keyTxEnabled: false
critical: disabled
guestVlan: disabled
guestVlanForwarding:none
authFailVlan: disabled
dynamicVlanCreation: disabled
multiVlanCreation: disabled
hostMode: single-host
dot1x: enabled
  protocolVersion: 1
authMac: disabled
authWeb: enabled
  method: PAP
  maxAuthFail: 3
  packetForwarding:
    10.0.0.1 80/tcp
    dns
    dhcp
twoStepAuthentication:
  configured: enabled
  actual: enabled
  order: dot1x auth-web
supplicantMac: none
```

Related commands [show auth diagnostics](#)
[show dot1x sessionstatistics](#)
[show dot1x statistics interface](#)
[show dot1x supplicant interface](#)

show auth sessionstatistics

Overview This command shows authentication session statistics for the specified interface, which may be a static channel (or static aggregator) or a dynamic (or LACP) channel group or a switch port.

Syntax show auth sessionstatistics [interface <interface-list>]

Parameter	Description
interface	Specify ports to show.
<interface-list>	The interfaces or ports to configure. An interface-list can be: • an interface (e.g. vlan2), a switch port (e.g. port1.0.6), a static channel group (e.g. sa2) or a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces, ports, static channel groups or dynamic (LACP) channel groups separated by a hyphen; e.g. vlan2-8, or port1.0.1-1.0.4, or sa1-2, or po1-2 • a comma-separated list of the above; e.g. port1.0.1, port1.0.4-1.0.6. Do not mix interface types in a list The specified interfaces must exist.

Mode Privileged Exec

Example To display authentication statistics for port1.0.6, enter the command:
awplus# show auth sessionstatistics interface port1.0.6

Output The following shows typical output.

Example output from the show auth sessionstatistics command

```
Authentication session statistics for interface port1.0.6
  session user name: manager
    session authentication method: Remote server
    session time: 19440 secs
    session terminat cause: Not terminated yet
```

show auth statistics interface

Overview Use this command to show the authentication statistics for the specified interface.

Syntax show auth statistics interface *<interface-list>*

Parameter	Description
<i><interface-list></i>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Example To display authentication statistics for port1.0.2, enter the command:
awplus# show auth statistics interface port1.0.2

Output The following shows typical output.

Example output from show auth statistics interface for a port

```
awplus# show auth statistics interface port1.0.2
802.1X statistics for interface port1.0.2
  EAPOL Frames Rx: 5 - EAPOL Frames Tx: 16
  EAPOL Start Frames Rx: 0 - EAPOL Logoff Frames Rx: 0
  EAP Rsp/Id Frames Rx: 3 - EAP Response Frames Rx: 2
  EAP Req/Id Frames Tx: 8 - EAP Request Frames Tx: 2
  Invalid EAPOL Frames Rx: 0 - EAP Length Error Frames Rx: 0
  EAPOL Last Frame Version Rx: 1 - EAPOL Last Frame
Src:00d0.59ab.7037
```

Related commands [show dot1x interface](#)

show auth supplicant

Overview Use this command to show the supplicant (client device) state when authentication is configured for the switch. Use the optional **brief** parameter to show a summary of the supplicant state.

Syntax show auth supplicant [<macadd>] [brief]

Parameter	Description
<macadd>	Mac (hardware) address of the supplicant. Entry format is HHHH.HHHH.HHHH (hexadecimal).
brief	Brief summary of the supplicant state.

Mode Privileged Exec

Examples To display a summary of authenticated supplicant information on the device, enter the command:

```
awplus# show auth supplicant brief
```

To display authenticated supplicant information on the device, enter the command:

```
awplus# show auth supplicant
```

To display authenticated supplicant information for the device with MAC address 0000.5E00.5301, enter the command:

```
awplus# show auth supplicant 0000.5E00.5301
```

Output The following shows typical output.

Example output from show auth supplicant brief

```
awplus#show auth supplicant brief
Interface port1.0.3
 authenticationMethod: dot1x/mac/web
 Two-Step Authentication
  firstMethod: mac
  secondMethod: dot1x/web
 totalSupplicantNum: 1
 authorizedSupplicantNum: 1
  macBasedAuthenticationSupplicantNum: 0
  dot1xAuthenticationSupplicantNum: 0
  webBasedAuthenticationSupplicantNum: 1
  otherAuthenticationSupplicantNum: 0
```

Interface	VID	Mode	MAC Address	Status	IP Address	Username
=====	====	====	=====	=====	=====	=====
port1.0.3	1	W	001c.233e.e15a	Authenticated	192.168.1.181	test
port1.0.3	1	D	0240.4040.4040	Authenticated	--	test
port1.0.3	1	Q	0230.3030.3030	Authenticated	192.168.1.181	test

Example output from show auth supplicant

```
awplus#show auth supplicant
Interface port1.0.3
 authenticationMethod: dot1x/mac/web
 Two-Step Authentication
  firstMethod: mac
  secondMethod: dot1x/web
 totalSupplicantNum: 1
 authorizedSupplicantNum: 1
  macBasedAuthenticationSupplicantNum: 0
  dot1xAuthenticationSupplicantNum: 0
  webBasedAuthenticationSupplicantNum: 1
  otherAuthenticationSupplicantNum: 0

Supplicant name: test
Supplicant address: 0000.5E00.5301
 authenticationMethod: WEB-based Authentication
 Two-Step Authentication:
  firstAuthentication: Pass - Method: mac
  secondAuthentication: Pass - Method: web
 portStatus: Authorized - currentId: 1
 abort:F fail:F start:F timeout:F success:T
 PAE: state: Authenticated - portMode: Auto
 PAE: reAuthCount: 0 - rxRespId: 0
 PAE: quietPeriod: 60 - maxReauthReq: 2
 BE: state: Idle - reqCount: 0 - idFromServer: 0
 CD: adminControlledDirections: in - operControlledDirections: in
 CD: bridgeDetected: false
 KR: rxKey: false
 KT: keyAvailable: false - keyTxEnabled: false
 dynamicVlanId: 999
 dynamicTaggedVlanId: 0
 RADIUS server group (auth): radius
 RADIUS server (auth): 192.168.1.40
 Session timeout enabled: No
 dynamicACL Rules:
  ip:deny ip 10.37.165.10/24 any
  ip:permit ip any any
  ipv6:deny ipv6 any any
 Quarantined: true
 Quarantine Vlan: 999
```

Example output from show auth supplicant 0000.5E00.5301

```
awplus#show auth supplicant 0000.5E00.5301
Interface port1.0.3
  Supplicant name: test
  Supplicant address: 0000.5E00.5301
  authenticationMethod: WEB-based Authentication
  Two-Step Authentication:
    firstAuthentication: Pass - Method: mac
    secondAuthentication: Pass - Method: web
  portStatus: Authorized - currentId: 1
  abort:F fail:F start:F timeout:F success:T
  PAE: state: Authenticated - portMode: Auto
  PAE: reAuthCount: 0 - rxRespId: 0
  PAE: quietPeriod: 60 - maxReauthReq: 2
  BE: state: Idle - reqCount: 0 - idFromServer: 0
  CD: adminControlledDirections: in - operControlledDirections: in
  CD: bridgeDetected: false
  Quarantined: true
  Quarantine Vlan: 999
  KR: rxKey: false
  KT: keyAvailable: false - keyTxEnabled: false
  RADIUS server group (auth): radius
  RADIUS server (auth): 192.168.1.40
  Session timeout enabled: No
  dynamicACL Rules:
    ip:deny ip 10.37.165.10/24 any
    ip:permit ip any any
    ipv6:deny ipv6 any any
```

Related commands

- [aaa accounting auth-mac](#)
- [aaa accounting auth-web](#)
- [aaa accounting dot1x](#)
- [aaa authentication auth-mac](#)
- [aaa authentication auth-web](#)
- [aaa authentication dot1x](#)

show auth supplicant interface

Overview This command shows the supplicant (client device) state for the authentication mode set for the interface. Use the optional **brief** parameter to show a summary of the supplicant state.

Syntax show auth-web supplicant interface *<interface-list>* [brief]

Parameter	Description
<i><interface-list></i>	The interfaces or ports to configure. An interface-list can be: • an interface (e.g. v lan2), a switch port (e.g. port1.0.6), a static channel group (e.g. sa2) or a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces, ports, static channel groups or dynamic (LACP) channel groups separated by a hyphen; e.g. v lan2-8, or port1.0.1-1.0.4, or sa1-2, or po1-2 • a comma-separated list of the above; e.g. port1.0.1, port1.0.4-1.0.6. Do not mix interface types in a list The specified interfaces must exist.
brief	Brief summary of the supplicant state.

Mode Privileged Exec

Examples To display the authenticated supplicant on the interface port1.0.2, enter the command:

```
awplus# show auth supplicant interface port1.0.2
```

To display brief summary output for the authenticated supplicant on the interface port1.0.2, enter the command:

```
awplus# show auth supplicant interface port1.0.2 brief
```

show auth two-step supplicant brief

Overview This command displays the supplicant state of the two-step authentication feature on the interface.

Syntax show auth two-step supplicant [interface <interface-list>]
brief

Parameter	Description
interface	The interface selected for display.
<interface-list>	The interfaces to display information about. An interface-list can be: • a VLAN (e.g. vlan2) • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of interfaces separated by a hyphen (e.g. port1.0.1-port1.0.3) • a comma-separated list (e.g. port1.0.1, port1.0.3-port1.0.4). Do not mix interface types in a list.

Mode Privileged Exec

Usage notes Do not mix interface types in a list. The specified interfaces must exist.

Example To display the supplicant state of the two-step authentication feature, enter the command:

```
awplus# show two-step supplicant interface port1.0.2 brief
```

Output The following shows typical output.

Example output from show auth two-step supplicant brief

```
interface port1.0.2
  authenticationMethod: dot1x/mac

  Two-Step Authentication:
    firstMethod:mac
    secondMethod:dot1x
    totalSupplicantNum: 1
    authorizedSupplicantNum: 1
    macBasedAuthenticationSupplicantNum: 0
    dot1xAuthenticationSupplicantNum: 1
    webBasedAuthenticationSupplicantNum: 0
    otherAuthenticationSupplicantNum: 0
```

Interface	VID	Mode	MAC Address	Status	FirstStep	SecondStep
=====	===	====	=====	=====	=====	=====
port1.0.8	1	D	000b..db67.00f7	Authenticated	Pass	Pass

Related commands [auth two-step enable](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

show auth-web-server

Overview This command shows the Web-Authentication server configuration and status on the switch.

Syntax show auth-web-server

Mode Privileged Exec

Example To display Web-Authentication server configuration and status, enter the command:

```
awplus# show auth-web-server
```

Output The following shows typical output.

Example output from the show auth-web-server command

```
Web authentication server
  Server status: enabled
  Server mode: none
  Server address: 192...
    DHCP server enabled
    DHCP lease time: 20
    DHCP WPAD Option URL: http://...
  HTTP Port No: 80
  Security: disabled
  Certification: default
  SSL Port No: 443
  Redirect URL: --
  Redirect Delay Time: 5
  HTTP Redirect: enabled
  Session keep: disabled
  PingPolling: disabled
  PingPollingType: Ping
  PingInterval: 30
  Timeout: 1
  FailCount: 5
  ReauthTimerReFresh: disabled
```

Related commands

- [auth-web-server ipaddress](#)
- [auth-web-server port](#)
- [auth-web-server redirect-delay-time](#)
- [auth-web-server redirect-url](#)
- [auth-web-server session-keep](#)
- [auth-web-server ssl](#)

show auth-web-server page

Overview This command displays the web-authentication page configuration and status.

Syntax show auth-web-server page

Mode Privileged Exec

Examples To show the web-authentication page information, use the command:
awplus# show auth-web-server page

Example output from the show auth-web-server page command

```
awplus#show auth-web-server page
Web authentication page
  Logo: auto
  Title: default
  Sub-Title: Web Authentication
  Welcome message: Your welcome message
  Success message: Your success message
```

Related commands

- [auth forward](#)
- [auth-web-server page logo](#)
- [auth-web-server page sub-title](#)
- [auth-web-server page success-message](#)
- [auth-web-server page title](#)
- [auth-web-server page welcome-message](#)

show proxy-autoconfig-file

Overview This command displays the contents of the proxy auto configuration (PAC) file.

Syntax show proxy-autoconfig-file

Mode Privileged Exec

Example To display the contents of the proxy auto configuration (PAC) file, enter the command:

```
awplus# show auth proxy-autoconfig-file
```

Output The following shows typical output.

Example output from show proxy-autoconfig-file

```
function FindProxyForURL(url,host)
{
  if (isPlainHostName(host) ||
      isInNet(host, "192.168.1.0", "255.255.255.0")) {
    return "DIRECT";
  }
  else {
    return "PROXY 192.168.110.1:8080";
  }
}
```

Related commands [copy proxy-autoconfig-file](#)
[erase proxy-autoconfig-file](#)

44

AAA Commands

- Contents**
- **Introduction** on page 2297
 - **aaa accounting auth-mac** on page 2298
 - **aaa accounting auth-web** on page 2301
 - **aaa accounting commands** on page 2304
 - **aaa accounting dot1x** on page 2306
 - **aaa accounting login** on page 2309
 - **aaa accounting update** on page 2313
 - **aaa authentication auth-mac** on page 2315
 - **aaa authentication auth-web** on page 2317
 - **aaa authentication dot1x** on page 2319
 - **aaa authentication enable default group tacacs+** on page 2321
 - **aaa authentication enable default local** on page 2324
 - **aaa authentication login** on page 2325
 - **aaa authorization commands** on page 2328
 - **aaa authorization config-commands** on page 2330
 - **aaa group server** on page 2331
 - **aaa local authentication attempts lockout-time** on page 2333
 - **aaa local authentication attempts max-fail** on page 2334
 - **aaa local authentication attempts max-fail remote-login-only** on page 2336
 - **aaa login fail-delay** on page 2337
 - **accounting login** on page 2338
 - **authorization commands** on page 2339
 - **clear aaa local user lockout** on page 2341
 - **debug aaa** on page 2342
 - **login authentication** on page 2343
 - **proxy-port** on page 2344
 - **radius-secure-proxy aaa** on page 2345
 - **server (radsecproxy-aaa)** on page 2346
 - **server mutual-authentication** on page 2348
 - **server name-check** on page 2349
 - **server trustpoint** on page 2350
 - **show aaa local user locked** on page 2352
 - **show aaa server group** on page 2354
 - **show debugging aaa** on page 2355
 - **show radius server group** on page 2356
 - **undebg aaa** on page 2358

Introduction

Overview AAA is the collective title for the three related functions of Authentication, Authorization and Accounting. These functions can be applied in a variety of methods with a variety of servers.

The purpose of the AAA commands is to map instances of the AAA functions to sets of servers. The Authentication function can be performed in multiple contexts, such as authentication of users logging in at a console, or 802.1X-Authentication of devices connecting to Ethernet ports.

For each of these contexts, you may want to use different sets of servers for examining the proffered authentication credentials and deciding if they are valid. AAA Authentication commands enable you to specify which servers will be used for different types of authentication.

This chapter provides an alphabetical reference for AAA commands for Authentication, Authorization and Accounting. For more information, see the [**AAA and Port_Authentication Feature Overview and Configuration Guide**](#).

aaa accounting auth-mac

Overview This command configures an accounting method list for MAC-based authentication. An accounting method list specifies what type of accounting messages are sent and which RADIUS servers the accounting messages are sent to. Use this command to configure either the default method list, which is automatically applied to interfaces with MAC-based authentication enabled, or a named method list, which can be applied to an interface with the **auth-mac accounting** command.

Use the **no** variant of this command to disable either the default or a named accounting method list for MAC-based authentication. Once all method lists are disabled, AAA accounting for MAC-based authentication is disabled globally.

Syntax `aaa accounting auth-mac {default|<list-name>} {start-stop|stop-only|none} group {<group-name>|radius}`
`no aaa accounting auth-mac {default|<list-name>}`

Parameter	Description
default	Configure the default accounting method list
<list-name>	Configure a named accounting method list
start-stop	Sends a start accounting message at the beginning of the session and a stop accounting message at the end of the session.
stop-only	Only sends a stop accounting message at the end of the session.
none	No accounting record sent.
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default RADIUS accounting for MAC-based Authentication is disabled by default

Mode Global Configuration

Usage notes This command can be used to configure either the default accounting method list or a named accounting method list:

- **default**: the default accounting method list which is automatically applied to all interfaces with MAC-based authentication enabled.
- **<list-name>**: a user named list which can be applied to an interface using the **auth-mac accounting** command.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius**: use all RADIUS servers configured by **radius-server host** command
- **group <group-name>**: use the specified RADIUS server group configured with the **aaa group server** command

The accounting event to send to the RADIUS server is configured with the following options:

- **start-stop**: sends a **start** accounting message at the beginning of a session and a **stop** accounting message at the end of the session.
- **stop-only**: sends a **stop** accounting message at the end of a session.
- **none**: disables accounting.

Examples To enable the default RADIUS accounting for MAC-based authentication, and use all available RADIUS servers, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa accounting auth-mac default start-stop group radius
```

To disable RADIUS accounting for MAC-based Authentication, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa accounting auth-mac default
```

To enable a named RADIUS accounting method list 'vlan10_acct' for MAC-based authentication, with the RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa accounting auth-mac vlan10_acct start-stop group rad_group_vlan10
```

To disable a named RADIUS accounting method list 'vlan10_acct' for MAC-based authentication, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa accounting auth-mac vlan10_acct
```

Related commands

- aaa authentication auth-mac**
- aaa group server**
- auth-mac accounting**
- auth-mac enable**
- radius-server host**
- show aaa server group**

aaa accounting auth-web

Overview This command configures an accounting method list for Web-based authentication. An accounting method list specifies what type of accounting messages are sent and which RADIUS servers the accounting messages are sent to. Use this command to configure either the default method list, which is automatically applied to interfaces with Web-based authentication enabled, or a named method list, which can be applied to an interface with the **auth-web accounting** command.

Use the **no** variant of this command to disable either the default or a named accounting method list for Web-based authentication. Once all method lists are disabled, AAA accounting for Web-based authentication is disabled globally.

Syntax `aaa accounting auth-web {default|<list-name>} {start-stop|stop-only|none} group {<group-name>|radius}`
`no aaa accounting auth-web {default|<list-name>}`

Parameter	Description
default	Configure the default accounting method list
<list-name>	Configure a named accounting method list
start-stop	Sends a start accounting message at the beginning of the session and a stop accounting message at the end of the session.
stop-only	Only sends a stop accounting message at the end of the session.
none	No accounting record sent.
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default RADIUS accounting for Web-based authentication is disabled by default.

Mode Global Configuration

Usage notes This command can be used to configure either the default accounting method list or a named accounting method list:

- **default:** the default accounting method list which is automatically applied to all interfaces with Web-based authentication enabled.
- **<list-name>:** a user named list which can be applied to an interface using the **auth-web accounting** command.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius:** use all RADIUS servers configured by **radius-server host** command
- **group <group-name>:** use the specified RADIUS server group configured with the **aaa group server** command

Configure the accounting event to be sent to the RADIUS server with the following options:

- **start-stop:** sends a start accounting message at the beginning of a session and a stop accounting message at the end of the session.
- **stop-only:** sends a stop accounting message at the end of a session.
- **none:** disables accounting.

Examples To enable the default RADIUS accounting method for Web-based authentication, and use all available RADIUS servers, use the commands:

```
awplus# configure terminal
awplus(config)# aaa accounting auth-web default start-stop group
radius
```

To disable the default RADIUS accounting method for Web-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting auth-web default
```

To enable a named RADIUS accounting method list 'vlan10_acct' for Web-based authentication, with the RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
awplus(config)# aaa accounting auth-web vlan10_acct start-stop
group rad_group_vlan10
```

To disable a named RADIUS accounting method list 'vlan10_acct' for Web-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting auth-web vlan10_acct
```

Related commands

- aaa authentication auth-web**
- aaa group server**
- auth-web accounting**
- auth-web enable**
- radius-server host**
- show aaa server group**

aaa accounting commands

Overview This command configures and enables TACACS+ accounting on commands entered at a specified privilege level. Once enabled for a privilege level, accounting messages for commands entered at that privilege level will be sent to a TACACS+ server.

In order to account for all commands entered on a device, configure command accounting for each privilege level separately.

The command accounting message includes, the command as entered, the date and time the command finished executing, and the user-name of the user who executed the command.

Use the **no** variant of this command to disable command accounting for a specified privilege level.

TACACS+ is not available in Secure Mode (see the [crypto secure-mode](#) command).

Syntax `aaa accounting commands <1-15> default stop-only group tacacs+`
`no aaa accounting commands <1-15> default`

Parameter	Description
<1-15>	The privilege level being configured, in the range 1 to 15.
default	Use the default method list, this means the command is applied globally to all user exec sessions.
stop-only	Send accounting message when the commands have stopped executing.
group	Specify the server group where accounting messages are sent. Only the tacacs+ group is available for this command.
tacacs+	Use all TACACS+ servers configured by the tacacs-server host command.

Default TACACS+ command accounting is disabled by default.

Mode Global Configuration

Usage notes This command only supports a **default** method list, this means that it is applied to every console and VTY line.

The **stop-only** parameter indicates that the command accounting messages are sent to the TACACS+ server when the commands have stopped executing.

The **group tacacs+** parameters signifies that the command accounting messages are sent to the TACACS+ servers configured by the **tacacs-server host** command.

Note that up to four TACACS+ servers can be configured for accounting. The servers are checked for reachability in the order they are configured with only the first reachable server being used. If no server is found, the accounting message is dropped.

Command accounting cannot coexist with triggers. An error message is displayed if you attempt to enable command accounting while a trigger is configured. Likewise, an error message is displayed if you attempt to configure a trigger while command accounting is configured.

Examples To configure command accounting for privilege levels 1, 7, and 15, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa accounting commands 1 default stop-only
group tacacs+
awplus(config)# aaa accounting commands 7 default stop-only
group tacacs+
awplus(config)# aaa accounting commands 15 default stop-only
group tacacs+
```

To disable command accounting for privilege levels 1, 7, and 15, use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting commands 1 default
awplus(config)# no aaa accounting commands 7 default
awplus(config)# no aaa accounting commands 15 default
```

Related commands [aaa authentication login](#)
[aaa accounting login](#)
[accounting login](#)
[tacacs-server host](#)

aaa accounting dot1x

Overview Use this command to configure an accounting method list for IEEE 802.1X-based authentication. An accounting method list specifies what type of accounting messages are sent and which RADIUS servers the accounting messages are sent to. Use this command to configure either the default method list, which is automatically applied to interfaces with IEEE 802.1X-based authentication enabled, or a named method list, which can be applied to an interface with the **dot1x accounting** command.

Use the **no** variant of this command to disable either the default or a named accounting method list for 802.1X-based authentication. Once all method lists are disabled, AAA accounting for 802.1x-based authentication is disabled globally.

Syntax `aaa accounting dot1x {default|<list-name>} {start-stop|stop-only|none} group {<group-name>|radius}`
`no aaa accounting dot1x {default|<list-name>}`

Parameter	Description
default	Configure the default accounting method list
<list-name>	Configure a named accounting method list
start-stop	Sends a start accounting message at the beginning of the session and a stop accounting message at the end of the session.
stop-only	Only sends a stop accounting message at the end of the session.
none	No accounting record sent.
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default RADIUS accounting for 802.1X-based authentication is disabled by default (there is no default server set by default).

Mode Global Configuration

Usage notes This command can be used to configure either the default accounting method list or a named accounting method list:

- **default**: the default accounting method list which is automatically applied to all interfaces with 802.1X-based authentication enabled.
- **<list-name>**: a user named list which can be applied to an interface using the **dot1x accounting** command.

There are two ways to define servers where RADIUS accounting messages will be sent:

- **group radius**: use all RADIUS servers configured by **radius-server host** command.
- **group <group-name>**: use the specified RADIUS server group configured with the **aaa group server** command.

The accounting event to send to the RADIUS server is configured by the following options:

- **start-stop**: sends a **start** accounting message at the beginning of a session and a **stop** accounting message at the end of the session.
- **stop-only**: sends a **stop** accounting message at the end of a session.
- **none**: disables accounting.

Examples To enable RADIUS accounting for 802.1X-based authentication, and use all available RADIUS Servers, use the commands:

```
awplus# configure terminal
awplus(config)# aaa accounting dot1x default start-stop group
radius
```

To disable RADIUS accounting for 802.1X-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting dot1x default
```

To enable a named RADIUS accounting method list 'vlan10_acct' for 802.1X-based authentication, with the RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
awplus(config)# aaa accounting dot1x vlan10_acct start-stop
group rad_group_vlan10
```

To disable a named RADIUS accounting method list 'vlan10_acct' for 802.1X-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting dot1x vlan10_acct
```

Related commands

- aaa accounting update**
- aaa authentication dot1x**
- aaa group server**
- dot1x accounting**
- dot1x port-control**
- radius-server host**
- show aaa server group**

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

aaa accounting login

Overview This command configures RADIUS and TACACS+ accounting for login shell sessions. The specified method list name can be used by the **accounting login** command in the Line Configuration mode. If the **default** parameter is specified, then this creates a default method list that is applied to every console and VTY line, unless another accounting method list is applied on that line.

Note that unlimited RADIUS servers and up to four TACACS+ servers can be configured and consulted for accounting. The first server configured is regarded as the primary server and if the primary server fails then the backup servers are consulted in turn. A backup server is consulted if the primary server fails, i.e. is unreachable.

TACACS+ is not available in Secure Mode (see the **crypto secure-mode** command).

Use the **no** variant of this command to remove an accounting method list for login shell sessions configured by an **aaa accounting login** command. If the method list being deleted is already applied to a console or VTY line, accounting on that line will be disabled. If the default method list name is removed by this command, it will disable accounting on every line that has the default accounting configuration.

Syntax `aaa accounting login {default|<list-name>}{start-stop|stop-only|none} {group {radius|tacacs+|<group-name>}}`
`no aaa accounting login {default|<list-name>}`

Parameter	Description
default	Default accounting method list.
<list-name>	Named accounting method list.
start-stop	Start and stop records to be sent.
stop-only	Stop records to be sent.
none	No accounting record to be sent.
group	Specify the servers or server group where accounting packets are sent.
radius	Use all RADIUS servers configured by the radius-server host .
tacacs+	Use all TACACS+ servers configured by the tacacs-server host command.
<group-name>	Use the specified RADIUS server group, as configured by the aaa group server command.

Default Accounting for login shell sessions is disabled by default.

Mode Global Configuration

Usage notes This command enables you to define a named accounting method list. The items that you define in the accounting options are:

- the types of accounting packets that will be sent
- the set of servers to which the accounting packets will be sent

You can define a default method list with the name **default** and any number of other named method lists. The name of any method list that you define can then be used as the *<list-name>* parameter in the **accounting login** command.

If the method list name already exists, the command will replace the existing configuration with the new one.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius** : use all RADIUS servers configured by **radius-server host** command
- **group <group-name>** : use the specified RADIUS server group configured with the **aaa group server** command

There is one way to define servers where TACACS+ accounting messages are sent:

- **group tacacs+** : use all TACACS+ servers configured by **tacacs-server host** command

The accounting event to send to the RADIUS or TACACS+ server is configured with the following options:

- **start-stop** : sends a **start** accounting message at the beginning of a session and a **stop** accounting message at the end of the session.
- **stop-only** : sends a **stop** accounting message at the end of a session.
- **none** : disables accounting.

Examples To configure RADIUS accounting for login shell sessions, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa accounting login default start-stop group
radius
```

To configure TACACS+ accounting for login shell sessions, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa accounting login default start-stop group
tacacs+
```

To reset the configuration of the default accounting list, use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting login default
```

Related commands

- [aaa accounting commands](#)
- [aaa authentication login](#)
- [aaa accounting login](#)
- [aaa accounting update](#)
- [accounting login](#)
- [radius-server host](#)
- [tacacs-server host](#)

aaa accounting update

Overview This command enables periodic accounting reporting to either the RADIUS or TACACS+ accounting server(s) wherever login accounting has been configured.

Note that unlimited RADIUS servers and up to four TACACS+ servers can be configured and consulted for accounting. The first server configured is regarded as the primary server and if the primary server fails then the backup servers are consulted in turn. A backup server is consulted if the primary server fails, i.e. is unreachable.

Use the **no** variant of this command to disable periodic accounting reporting to the accounting server(s).

Syntax `aaa accounting update [periodic <1-65535>]`
`no aaa accounting update`

Parameter	Description
<code>periodic</code>	Send accounting records periodically.
<code><1-65535></code>	The interval to send accounting updates (in minutes). The default is 30 minutes.

Default Disabled

Mode Global Configuration

Usage notes Use this command to enable the device to send periodic AAA login accounting reports to the accounting server. When periodic accounting reporting is enabled, interim accounting records are sent at the interval specified by the **periodic** parameter. The accounting updates are start messages.

If the **no** variant of this command is used to disable periodic accounting reporting, any interval specified by the **periodic** parameter is reset to the default of 30 minutes when accounting reporting is re-enabled, unless this interval is specified.

Examples To configure the switch to send period accounting updates every 30 minutes, the default period, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa accounting update
```

To configure the switch to send period accounting updates every 10 minutes, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa accounting update periodic 10
```

To disable periodic accounting updates wherever accounting has been configured, use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa accounting update
```

Related commands

- aaa accounting auth-mac**
- aaa accounting auth-web**
- aaa accounting dot1x**
- aaa accounting login**
- radius-server host**

aaa authentication auth-mac

Overview This command enables MAC-based authentication globally and allows you to enable either the default authentication method list (in this case, a list of RADIUS servers), which is automatically applied to every interface running MAC-based authentication, or a user named authentication method list, which is applied to an interface with the **auth-mac authentication** command.

Use the **no** variant of this command to disable either the default or a named method list for MAC-based authentication. Once all method lists are disabled MAC-based authentication is disabled globally.

Syntax `aaa authentication auth-mac {default|<list-name>} group {<group-name>|radius}`
`no aaa authentication auth-mac {default|<list-name>}`

Parameter	Description
default	Configure the default authentication method list
<list-name>	Configure a named authentication method list
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default MAC-based Port Authentication is disabled by default.

Mode Global Configuration

Usage notes This command can be used to configure either the default authentication method list or a named authentication method list:

- **default**: the default authentication method list which is automatically applied to all interfaces with Web-based authentication enabled.
- **<list-name>**: a user named list which can be applied to an interface using the **auth-web authentication** command.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius**: use all RADIUS servers configured by **radius-server host** command
- **group <group-name>**: use the specified RADIUS server group configured with the **aaa group server** command

All configured RADIUS Servers are automatically members of the server group **radius**. If a server is added to a named group **<group-name>**, it also remains a member of the group **radius**.

Examples To enable MAC-based authentication globally for all RADIUS servers, and use all available RADIUS servers, use the commands:

```
awplus# configure terminal
awplus(config)# aaa authentication auth-mac default group
radius
```

To disable MAC-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication auth-mac default
```

To enable MAC-based authentication for named list 'vlan10_auth', with RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
awplus(config)# aaa authentication auth-mac vlan10_auth group
rad_group_vlan10
```

To disable MAC-based authentication for named list 'vlan10_auth', use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication auth-mac vlan10_acct
```

Related commands

- aaa accounting auth-mac**
- aaa group server**
- auth-mac authentication**
- auth-mac enable**
- radius-server host**
- show aaa server group**

aaa authentication auth-web

Overview This command enables Web-based authentication globally and allows you to enable either the default authentication method list (in this case, a list of RADIUS servers), which is automatically applied to every interface running Web-based authentication, or a user named authentication method list, which is applied to an interface with the **auth-web authentication** command.

Use the **no** variant of this command to disable either the default or a named method list for Web-based authentication. Once all method lists are disabled Web-based authentication is disabled globally.

Syntax `aaa authentication auth-web {default|<list-name>} group {<group-name>|radius}`
`no aaa authentication auth-web {default|<list-name>}`

Parameter	Description
default	Configure the default authentication method list
<list-name>	Configure a named authentication method list
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default Web-based authentication is disabled by default.

Mode Global Configuration

Usage notes This command can be used to configure either the default authentication method list or a named authentication method list:

- **default:** the default authentication method list which is automatically applied to all interfaces with Web-based authentication enabled.
- **<list-name>:** a user named list which can be applied to an interface using the **auth-web authentication** command.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius:** use all RADIUS servers configured by **radius-server host** command
- **group <group-name>:** use the specified RADIUS server group configured with the **aaa group server** command

Note that you need to configure an IPv4 address for the VLAN interface on which Web authentication is running.

Examples To enable Web-based authentication globally for all RADIUS servers, and use all available RADIUS servers, use the commands:

```
awplus# configure terminal
awplus(config)# aaa authentication auth-web default group
radius
```

To disable Web-based authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication auth-web default
```

To enable Web-based authentication for named list 'vlan10_auth', with RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
awplus(config)# aaa authentication auth-web vlan10_auth group
rad_group_vlan10
```

To disable Web-based authentication for named list 'vlan10_auth', use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication vlan10_auth
```

Related commands

- aaa accounting auth-web**
- aaa group server**
- auth-web authentication**
- auth-web enable**
- radius-server host**

aaa authentication dot1x

Overview Use this command to enable IEEE 802.1X-based authentication globally and to allow you to enable either the default authentication method list (in this case, a list of RADIUS servers), which is automatically applied to every interface running IEEE 802.1X-based authentication, or a user named authentication method list, which is applied to an interface with the **dot1x authentication** command.

Use the **no** variant of this command to disable either the default or a named method list for 802.1X-based authentication. Once all method lists are disabled 802.1x-based authentication is disabled globally.

Syntax `aaa authentication dot1x {default|<list-name>} group {<group-name>|radius}`
`no aaa authentication dot1x {default|<list-name>}`

Parameter	Description
default	Configure the default authentication method list
<list-name>	Configure a named authentication method list
group	Use a server group
<group-name>	Server group name.
radius	Use all RADIUS servers.

Default 802.1X-based Port Authentication is disabled by default.

Mode Global Configuration

Usage notes This command can be used to configure either the default authentication method list or a named authentication method list:

- **default:** the default authentication method list which is automatically applied to all interfaces with 802.1X-based authentication enabled.
- **<list-name>:** a user named list which can be applied to an interface using the **aaa authentication dot1x** command.

There are two ways to define servers where RADIUS accounting messages are sent:

- **group radius:** use all RADIUS servers configured by **radius-server host** command
- **group <group-name>:** use the specified RADIUS server group configured with the **aaa group server** command

Examples To enable 802.1X-based authentication globally with all RADIUS servers, and use all available RADIUS servers, use the command:

```
awplus# configure terminal
awplus(config)# aaa authentication dot1x default group radius
```

To disable 802.1X-based authentication, use the command:

```
awplus# configure terminal
awplus(config)# no aaa authentication dot1x default
```

To enable 802.1X-based authentication for named list 'vlan10_auth', with RADIUS server group 'rad_group_vlan10', use the commands:

```
awplus# configure terminal
awplus(config)# aaa authentication dot1x vlan10_auth group
rad_group_vlan10
```

To disable 802.1X-based authentication for named list 'vlan10_auth' use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication dot1x vlan10_acct
```

Related commands

- [**aaa accounting dot1x**](#)
- [**aaa group server**](#)
- [**dot1x authentication**](#)
- [**dot1x port-control**](#)
- [**radius-server host**](#)
- [**show aaa server group**](#)

Command changes Version 5.4.9-2.1: command added to AR2050V, AR3050S, and AR4050S

aaa authentication enable default group tacacs+

Overview This command enables privilege level authentication against a TACACS+ server.

Use the **no** variant of this command to disable privilege level authentication.

TACACS+ is not available in Secure Mode (see the **crypto secure-mode** command).

Syntax `aaa authentication enable default group tacacs+ [local] [none]`
`no aaa authentication enable default`

Parameter	Description
local	Use the locally configured enable password (enable password command) for authentication.
none	No authentication.

Default Local privilege level authentication is enabled by default (**aaa authentication enable default local** command).

Mode Global Configuration

Usage notes A user is configured on a TACACS+ server with a maximum privilege level. When they enter the **enable (Privileged Exec mode)** command they are prompted for an enable password which is authenticated against the TACACS+ server. If the password is correct and the specified privilege level is equal to or less than the users maximum privilege level, then they are granted access to that level. If the user attempts to access a privilege level that is higher than their maximum configured privilege level, then the authentication session will fail and they will remain at their current privilege level.

NOTE: *If both are specified, you must always specify first.*

If the TACACS+ server goes offline, or is not reachable during enable password authentication, and command level authentication is configured as:

- **aaa authentication enable default group tacacs+**
then the user is never granted access to Privileged Exec mode.
- **aaa authentication enable default group tacacs+ local**
then the user is authenticated using the locally configured enable password, which if entered correctly grants the user access to Privileged Exec mode. If no enable password is locally configured (**enable password** command), then the enable authentication will fail until the TACACS+ server becomes available again.
- **aaa authentication enable default group tacacs+ none**
then the user is granted access to Privileged Exec mode with no authentication. This is true even if a locally configured enable password is configured.
- **aaa authentication enable default group tacacs+ local none**
then the user is authenticated using the locally configured enable password. If no enable password is locally configured, then the enable authentication will grant access to Privileged Exec mode with no authentication.

If the password for the user is not successfully authenticated by the server, then the user is again prompted for an enable password when they enter **enable** via the CLI.

Examples To enable a privilege level authentication method that will not allow the user to access Privileged Exec mode if the TACACS+ server goes offline, or is not reachable during enable password authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication enable default group tacacs+
```

To enable a privilege level authentication method that will allow the user to access Privileged Exec mode if the TACACS+ server goes offline, or is not reachable during enable password authentication, and a locally configured enable password is configured, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication enable default group tacacs+
local
```

To disable privilege level authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication enable default
```

Related commands

- [aaa authentication login](#)
- [aaa authentication enable default local](#)
- [enable \(Privileged Exec mode\)](#)
- [enable password](#)
- [enable secret \(deprecated\)](#)
- [tacacs-server host](#)

aaa authentication enable default local

Overview This command enables local privilege level authentication.
Use the **no** variant of this command to disable local privilege level authentication.

Syntax `aaa authentication enable default local`
`no aaa authentication enable default`

Default Local privilege level authentication is enabled by default.

Mode Global Configuration

Usage notes The privilege level configured for a particular user in the local user database is the privilege threshold above which the user is prompted for an **enable (Privileged Exec mode)** command.

Examples To enable local privilege level authentication, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authentication enable default local
```

To disable local privilege level authentication, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa authentication enable default
```

Related commands [aaa authentication login](#)
[enable \(Privileged Exec mode\)](#)
[enable password](#)
[enable secret \(deprecated\)](#)

aaa authentication login

Overview Use this command to create an ordered list of methods for authenticating user logins. It can also be used to replace an existing method list with a list of the same name. Specify one or more of the options **local** or **group**, in the order you want them to be applied. If the **default** method list name is specified, it is applied to every console and VTY line immediately unless another method list is applied to that line by the **login authentication** command. To apply a non-default method list, you must also use the **login authentication** command.

TACACS+ is not available in Secure Mode (see the **crypto secure-mode** command).

Use the **no** variant of this command to remove a method list from user login authentication. The specified method list name is deleted from the configuration. If the method list name has been applied to any console or VTY line, user login authentication on that line will fail.

Note that the **no aaa authentication login default** command does not remove the default method list. This will return the default method list to its default state (**local** is the default).

Syntax `aaa authentication login {default|<list-name>} {[local] [group
{radius|ldap|tacacs+|<group-name>}]}`
`no aaa authentication login {default|<list-name>}`

Parameter	Description
default	Set the default authentication server for user login.
<list-name>	Name of authentication server.
local	Use the local username database.
group	Use server group.
radius	Use all RADIUS servers configured by the radius-server host command.
ldap	Use all LDAP servers configured by the ldap-server command.
tacacs+	Use all TACACS+ servers configured by the tacacs-server host command.
<group-name>	Use the specified RADIUS or LDAP server group.

Default If the default server is not configured using this command, user login authentication uses the local user database only.

If the **default** method list name is specified, it is applied to every console and VTY line immediately unless a named method list server is applied to that line by the **login authentication** command.

local is the default state for the default method list unless a named method list is applied to that line by the **login authentication** command. You can reset it to the default method list using the **no aaa authentication login default** command.

Mode Global Configuration

Usage notes When a user attempts to log in, the switch sends an authentication request to the first authentication server in the method list. If the first server in the list is reachable and it contains a username and password matching the authentication request, the user is authenticated and the login succeeds. If the authentication server denies the authentication request because of an incorrect username or password, the user login fails. If the first server in the method list is unreachable, the switch sends the request to the next server in the list, and so on.

For example, if the method list specifies **group tacacs+ local**, and a user attempts to log in with a password that does not match a user entry in the first TACACS+ server, if this TACACS+ server denies the authentication request, then the switch does not try any other TACACS+ servers nor the local user database; the user login fails.

Examples To configure the default authentication method list for user login to first use all available RADIUS servers for user login authentication, and then use the local user database, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication login default group radius
local
```

To configure the default authentication method list for user login to first use all available LDAP servers for user login authentication, and then use the local user database, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication login default group ldap
local
```

To configure a user login authentication method list called 'USERS' to first use the RADIUS server group 'RAD_GROUP1' for user login authentication, and then use the local user database, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication login USERS group RAD_GROUP1
local
```

To configure a user login authentication method list called 'USERS' to first use the TACACS+ servers for user login authentication, and then use the local user database, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa authentication login USERS group tacacs+
local
```

To return to the default method list (**local** is the default server), use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication login default
```

To delete an existing authentication method list 'USERS' created for user login authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# no aaa authentication login USERS
```

Related commands [aaa accounting commands](#)
[aaa authentication enable default group tacacs+](#)
[ldap-server](#)
[login authentication](#)
[radius-server host](#)

Command changes Version 5.5.2-1.1: **ldap** parameter added

aaa authorization commands

Overview This command configures a method list for commands authorization that can be applied to console or VTY lines. When command authorization is enabled for a privilege level, only authorized users can executed commands in that privilege level.

Use the **no** variant of this command to remove a named method list or disable the default method list for a privilege level.

Syntax `aaa authorization commands <privilege-level> {default|<list-name>} group tacacs+ [none]`
`no aaa authorization commands <privilege-level> {default|<list-name>}`

Parameter	Description
<privilege-level>	The privilege level of the set of commands the method list will be applied to. AlliedWare Plus defines three sets of commands, that are indexed by a level value: Level = 1: All commands that can be accessed by a user with privilege level between 1 and 6 inclusive Level = 7: All commands that can be accessed by a user with privilege level between 7 and 14 inclusive Level = 15: All commands that can be accessed by a user with privilege level 15
group	Specify the server group where authorization messages are sent. Only the tacacs+ group is available for this command.
tacacs+	Use all TACACS+ servers configured by the tacacs-server host command.
default	Configure the default authorization commands method list.
<list-name>	Configure a named authorization commands method list
none	If specified, this provides a local fallback to command authorization so that if authorization servers become unavailable then the device will accept all commands normally allowed for the privilege level of the user.

Mode Global Configuration

Usage notes TACACS+ command authorization provides centralized control of the commands available to a user of an AlliedWare Plus device. Once enabled:

- The command string and username are encrypted and sent to the first available configured TACACS+ server (the first server configured) for authorization.
- The TACACS+ server decides if the user is authorized to execute the command and returns the decision to the AlliedWare Plus device.
- Depending on this decision the device will then either execute the command or notify the user that authorization has failed.

If multiple TACACS+ servers are configured, and the first server is unreachable or does not respond, the other servers will be queried, in turn, for an authorization decision. If all servers are unreachable and a local fallback has been configured, with the **none** parameter, then commands are authorized based on the user's privilege level; the same behavior as if command authorization had not been configured. If, however, the local fallback is not configured and all servers become unreachable then all commands except **logout**, **exit**, and **quit** will be denied.

The **default** method list is defined with a local fallback unless configured differently using this command.

Example To configure a commands authorization method list, named TAC15, using all TACACS+ servers to authorize commands for privilege level 15, with a local fallback, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authorization commands 15 TAC15 group tacacs  
+ none
```

To configure the default method list to authorize commands for privilege level 7, with no local fallback, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authorization commands 7 default group  
tacacs+
```

To remove the authorization method list TAC15, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa authorization commands 15 TAC15
```

Related commands [aaa authorization config-commands](#)
[authorization commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

aaa authorization config-commands

Overview Use this command to enable command authorization on configuration mode commands. By default, command authorization applies to commands in exec mode only.

Use the **no** variant of this command to disable command authorization on configuration mode commands.

Syntax `aaa authorization config-commands`
`no aaa authorization config-commands`

Default By default, command authorization is disabled on configuration mode commands.

Mode Global Configuration

Usage notes If authorization of configuration mode commands is not enabled then all configuration commands are accepted by default, including command authorization commands.

NOTE: *Authorization of configuration commands is required for a secure TACACS+ command authorization configuration as it prevents the feature from being disabled to gain access to unauthorized exec mode commands.*

Example To enable command authorization for configuration mode commands, use the commands:

```
awplus# configure terminal
awplus(config)# aaa authorization config-commands
```

To disable command authorization for configuration mode commands, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authorization config-commands
```

Related commands [aaa authorization commands](#)
[authorization commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

aaa group server

Overview Use this command to create an AAA group of RADIUS or LDAP servers, and to enter Server Group Configuration mode.

A server group is used to specify a subset of RADIUS or LDAP servers in AAA commands. Once in Server Group Configuration mode you can add servers to the group.

Use the **no** variant of this command to remove an existing server group.

Syntax `aaa group server {radius|ldap} <group-name>`
`no aaa group server {radius|ldap} <group-name>`

Parameter	Description
radius	Create or configure a RADIUS server group.
ldap	Create or configure an LDAP server group.
<group-name>	Server group name.

Mode Global Configuration

Usage notes To add servers to a RADIUS or LDAP server group, use the **server** command. Each RADIUS server in a server group must be configured using the **radius-server host** command. Similarly, each LDAP server in a server group must be configured using the **ldap-server** command.

Server groups named 'radius' and 'ldap' are predefined and include all RADIUS and LDAP servers configured using the **radius-server host** or **ldap-server** commands.

Examples To create a RADIUS server group named 'GROUP1' with hosts 192.168.1.1, 192.168.2.1 and 192.168.3.1, use the commands:

```
awplus(config)# aaa group server radius GROUP1
awplus(config-sg)# server 192.168.1.1 auth-port 1812 acct-port 1813
awplus(config-sg)# server 192.168.2.1 auth-port 1812 acct-port 1813
awplus(config-sg)# server 192.168.3.1 auth-port 1812 acct-port 1813
```

To remove a RADIUS server group named 'GROUP1' from the configuration, use the command:

```
awplus(config)# no aaa group server radius GROUP1
```

To create an LDAP server group named 'GROUP2' with servers named 'SERVER1', 'SERVER2' and 'SERVER3', use the commands:

```
awplus(config)# aaa group server ldap GROUP2
awplus(config-ldap-group)# server SERVER1
awplus(config-ldap-group)# server SERVER2
awplus(config-ldap-group)# server SERVER3
```

To remove an LDAP server group named 'GROUP2' from the configuration, use the command:

```
awplus(config)# no aaa group server ldap GROUP2
```

Related commands

- [aaa accounting auth-mac](#)
- [aaa accounting auth-web](#)
- [aaa accounting dot1x](#)
- [aaa accounting login](#)
- [aaa authentication auth-mac](#)
- [aaa authentication auth-web](#)
- [aaa authentication dot1x](#)
- [aaa authentication login](#)
- [ldap-server](#)
- [radius-server host](#)
- [server \(ldap-group\)](#)
- [server \(RADIUS server group\)](#)
- [show ldap server group](#)
- [show radius server group](#)

Command changes Version 5.5.2-1.1: **ldap** parameter added

aaa local authentication attempts lockout-time

Overview This command configures the duration of the user lockout period.

Use the **no** variant of this command to restore the duration of the user lockout period to its default of 300 seconds (5 minutes).

Syntax `aaa local authentication attempts lockout-time <lockout-time>`
`no aaa local authentication attempts lockout-time`

Parameter	Description
<lockout-time>	<0-10000>. Time in seconds to lockout the user.

Mode Global Configuration

Default The default for the lockout-time is 300 seconds (5 minutes).

Usage notes While locked out all attempts to login with the locked account will fail. The lockout can be manually cleared by another privileged account using the **clear aaa local user lockout** command.

Examples To configure the lockout period to 10 minutes (600 seconds), use the commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa local authentication attempts lockout-time 600
```

To restore the default lockout period of 5 minutes (300 seconds), use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa local authentication attempts lockout-time
```

Related commands **aaa local authentication attempts max-fail**
aaa local authentication attempts max-fail remote-login-only
clear aaa local user lockout

aaa local authentication attempts max-fail

Overview This command configures the maximum number of failed login attempts before a user account is locked out. Every time a login attempt fails the failed login counter is incremented.

Use the **no** variant of this command to restore the maximum number of failed login attempts to the default setting (five failed login attempts).

Syntax `aaa local authentication attempts max-fail <failed-logins>`
`no aaa local authentication attempts max-fail`

Parameter	Description
<failed-logins>	<1-32>. Number of login failures allowed before locking out a user.

Mode Global Configuration

Default The default for the maximum number of failed login attempts is five failed login attempts.

Usage When the failed login counter reaches the limit configured by this command that user account is locked out for a specified duration configured by the [aaa local authentication attempts lockout-time](#) command.

When a successful login occurs the failed login counter is reset to 0. When a user account is locked out all attempts to login using that user account will fail.

Examples To configure the number of login failures that will lock out a user account to two login attempts, use the commands:

```
awplus# configure terminal
awplus(config)# aaa local authentication attempts max-fail 2
```

To restore the number of login failures that will lock out a user account to the default number of login attempts (five login attempts), use the commands:

```
awplus# configure terminal
awplus(config)# no aaa local authentication attempts max-fail
```

Related commands **aaa local authentication attempts logout-time**
aaa local authentication attempts max-fail remote-login-only
clear aaa local user logout

aaa local authentication attempts max-fail remote-login-only

Overview Use this command to configure account lockout to remote logins only. This means that console logins are not subject to lock out when this feature is configured.

This command allow users to login via the physical console port even when the account is locked due to reaching the maximum number of failed login attempts.

Use the **no** variant of this command to prevent users from logging in via the console port when the maximum number of failed login attempts is reached.

Syntax `aaa local authentication attempts max-fail remote-login-only`
`no aaa local authentication attempts max-fail remote-login-only`

Default Not set. Max-fail lockout applies to all logins.

Mode Global Configuration

Example To configure account lock-out to remote login only, use the commands:

```
awplus# configure terminal
awplus(config)# aaa local authentication attempts max-fail
remote-login-only
```

To configure account lock-out to apply to all logins, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa local authentication attempts max-fail
remote-login-only
```

Related commands [aaa local authentication attempts max-fail](#)
[aaa local authentication attempts lockout-time](#)
[clear aaa local user lockout](#)

Command changes Version 5.5.4-1.2: command added

aaa login fail-delay

Overview Use this command to configure the minimum time period between failed login attempts. This setting applies to login attempts via the console, SSH and Telnet.

Use the **no** variant of this command to reset the minimum time period to its default value.

Syntax `aaa login fail-delay <1-10>`
`no aaa login fail-delay`

Parameter	Description
<1-10>	The minimum number of seconds required between login attempts

Default 1 second

Mode Global configuration

Example To apply a delay of at least 5 seconds between login attempts, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa login fail-delay 5
```

Related commands [aaa authentication login](#)
[aaa local authentication attempts lockout-time](#)
[clear aaa local user lockout](#)

accounting login

Overview This command applies a login accounting method list to console or VTY lines for user login. When login accounting is enabled using this command, logging events generate an accounting record to the accounting server.

The accounting method list must be configured first using this command. If an accounting method list is specified that has not been created by this command then accounting will be disabled on the specified lines.

The **no** variant of this command resets AAA Accounting applied to console or VTY lines for local or remote login. **default** login accounting is applied after issuing the **no accounting login** command. Accounting is disabled with **default**.

Syntax accounting login {default|<list-name>}
no accounting login

Parameter	Description
default	Default accounting method list.
<list-name>	Named accounting method list.

Default By default login accounting is disabled in the **default** accounting server. No accounting will be performed until accounting is enabled using this command.

Mode Line Configuration

Examples To apply the accounting server USERS to all VTY lines, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 32
awplus(config-line)# accounting login USERS
```

Related commands [aaa accounting commands](#)
[aaa accounting login](#)

authorization commands

Overview This command applies a command authorization method list, defined using the **aaa authorization commands** command, to console and VTY lines.

Use the **no** variant of this command to reset the command authorization configuration on the console and VTY lines.

Syntax authorization commands <privilege-level> {default|<list-name>}
no authorization commands <privilege-level>

Parameter	Description
<privilege-level>	The privilege level of the set of commands the method list will be applied to. AlliedWare Plus defines three sets of commands, that are indexed by a level value: Level = 1: All commands that can be accessed by a user with privilege level between 1 and 6 inclusive Level = 7: All commands that can be accessed by a user with privilege level between 7 and 14 inclusive Level = 15: All commands that can be accessed by a user with privilege level 15
default	Configure the default authorization commands method list.
<list-name>	Configure a named authorization commands method list

Default The **default** method list is applied to each console and VTY line by default.

Mode Line Configuration

Usage notes If the specified method list does not exist users will not be able to execute any commands in the specified method list on the specified VTY lines.

Example To apply the TAC15 command authorization method list with privilege level 15 to VTY lines 0 to 5, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# authorization commands 15 TAC15
```

To reset the command authorization configuration with privilege level 15 on VTY lines 0 to 5, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# no authorization commands 15
```

Related commands [aaa authorization commands](#)
[aaa authorization config-commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

clear aaa local user logout

Overview Use this command to clear the logout on a specific user account or all user accounts.

Syntax clear aaa local user logout {username <username>|all}

Parameter	Description
username	Clear logout for the specified user.
<username>	Specifies the user account.
all	Clear logout for all user accounts.

Mode Privileged Exec

Examples To unlock the user account 'bob' use the following command:

```
awplus# clear aaa local user logout username bob
```

To unlock all user accounts use the following command:

```
awplus# clear aaa local user logout all
```

Related commands [aaa local authentication attempts logout-time](#)

debug aaa

Overview This command enables AAA debugging.

Use the **no** variant of this command to disable AAA debugging.

Syntax debug aaa [accounting|all|authentication|authorization]
no debug aaa [accounting|all|authentication|authorization]

Parameter	Description
accounting	Accounting debugging.
all	All debugging options are enabled.
authentication	Authentication debugging.
authorization	Authorization debugging.

Default AAA debugging is disabled by default.

Mode Privileged Exec

Examples To enable authentication debugging for AAA, use the command:

```
awplus# debug aaa authentication
```

To disable authentication debugging for AAA, use the command:

```
awplus# no debug aaa authentication
```

Related commands [show debugging aaa](#)
[undebug aaa](#)

login authentication

Overview Use this command to apply an AAA server for authenticating user login attempts from a console or remote logins on these console or VTY lines. The authentication method list must be specified by the **aaa authentication login** command. If the method list has not been configured by the **aaa authentication login** command, login authentication will fail on these lines.

Use the **no** variant of this command to reset AAA Authentication configuration to use the default method list for login authentication on these console or VTY lines.

Command login authentication {default|<list-name>}

Syntax no login authentication

Parameter	Description
default	The default authentication method list. If the default method list has not been configured by the aaa authentication login command, the local user database is used for user login authentication.
<list-name>	Named authentication server.

Default The default login authentication method list, as specified by the **aaa authentication login** command, is used to authenticate user login. If this has not been specified, the default is to use the local user database.

Mode Line Configuration

Examples To reset user authentication configuration on all VTY lines, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 32
awplus(config-line)# no login authentication
```

Related commands **aaa authentication login**
line

proxy-port

Overview Use this command to change the local UDP port used for communication between local RADIUS client applications and the RadSecProxy AAA application. Any unused UDP port may be selected. The default port is 1645.

Use the **no** variant of this command to change the UDP port back to the default of 1645.

Syntax proxy-port <port>
no proxy-port

Parameter	Description
<port>	UDP Port Number, 1-65536.

Default The default port is 1645.

Mode RadSecProxy AAA Configuration Mode

Usage notes It is not necessary to change the value from the default unless UDP port 1645 is required for another purpose. RADIUS requests received on this port from external devices will be ignored. The port is only used for local (intra-device) communication.

Example To configure change the UDP port to 7001, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)# proxy-port 7001
```

Related commands [radius-secure-proxy aaa](#)
[server \(radsecproxy-aaa\)](#)
[server name-check](#)
[server trustpoint](#)

radius-secure-proxy aaa

Overview Use this command to enter the RadSecProxy AAA (authentication, authorization, and accounting) application configuration mode. This application allows local RADIUS-based clients on system to communicate with remote RadSec servers via a secure (TLS) proxy.

Syntax radius-secure-proxy aaa

Mode Global Configuration Mode

Example To change mode from User Exec mode to the RadSecProxy AAA configuration mode, use the commands:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)#
```

Related commands

- proxy-port**
- server (radsecproxy-aaa)**
- server name-check**
- server trustpoint**

server (radsecproxy-aaa)

Overview Use this command to add a server to the RadSecProxy AAA application. Local RADIUS client applications will attempt, via the proxy, to communicate with any RadSec servers that are operational (in addition to any non-TLS RADIUS servers that are configured).

Use the **no** variant of this command to delete a previously-configured server from the RadSecProxy AAA application.

Syntax server {<hostname>|<ip-addr>} [timeout <1-1000>] [name-check {on|off}]
no server {<hostname>|<ip-addr>}

Parameter	Description
<hostname>	Hostname of RadSec server
	< Specify the client IPv4 address, in dotted decimal notation a (A.B.C.D).
	t Specify the amount of time that the RadSecProxy AAA application should wait for replies from this server. RADIUS server timeout (which defaults to 5 seconds).
	< Time in seconds to wait for a server reply.
	n Specify whether or not to enforce certificate name c checking for this client. If the parameter is not specified then the global behavior, which defaults to on , is used.
	Enable name checking for this client.
	Disable name checking for this client.

Mode RadSecProxy AAA Configuration Mode

Usage notes The server may be specified by its domain name or by its IPv4 address. If a domain name is used, it must be resolvable using a configured DNS name server.

Each server may be configured with a timeout; if not specified, the global timeout value for RADIUS servers will be used. The global timeout may be changed using the **radius-server timeout** command. The default global timeout is 5 seconds.

Each server may be configured to use certificate name-checking; if not specified, the global behavior defined by **server name-check** or **no server name-check** will be used. If name checking is enabled, the Common Name portion of the subject field of the server's X.509 certificate must match the domain name or IP address specified in this command.

Example To add a server 'mynas.local' with a timeout of 3 seconds, and name checking off, use the commands:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)# server mynas.local name-check
off
```

Related commands

- proxy-port**
- radius-secure-proxy aaa**
- server name-check**
- server trustpoint**

server mutual-authentication

Overview This command enables or disables mutual certificate authentication for all RadSecProxy servers. When enabled, the RadSecProxy AAA application will send a local X.509 certificate to the server when establishing a TLS connection.

Use the **no** variant of this command to disable mutual certificate validation causing the RadSecProxy AAA application to not transmit a certificate to the server.

NOTE: *If mutual authentication is disabled on the client (AAA) application but enabled on the server, a connection will not be established.*

Syntax server mutual-authentication
no server mutual-authentication

Default Mutual authentication is enabled by default.

Mode RadSecProxy AAA Configuration Mode

Example Disable mutual certificate validation with the following command:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)# no server mutual-authentication
```

Related commands [radius-secure-proxy aaa](#)
[server name-check](#)
[server \(radsecproxy-aaa\)](#)

Command changes Version 5.4.6-2.1: command added

server name-check

Overview This command sets the global behavior for certificate name-checking for the RadSecProxy AAA application to **on**. This behavior will be used for all servers associated with the application that do not specify a behavior on a per-server basis. If name-checking is enabled, the Common Name portion of the subject field of the client's X.509 certificate must match the domain name or IP address specified in the **server (radsecproxy-aaa)** command.

Use the **no** variant of this command to set the global behavior for certificate name checking to **off**

Syntax server name-check
no server name-check

Default Certificate name checking is on by default.

Mode RadSecProxy AAA Configuration Mode

Example Disable certificate name checking globally with the following command:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)# no server name-check
```

Related commands [proxy-port](#)
[radius-secure-proxy aaa](#)
[server \(radsecproxy-aaa\)](#)
[server trustpoint](#)

server trustpoint

Overview This command adds one or more trustpoints to be used with the RadSecProxy AAA application. Multiple trustpoints may be specified, or the command may be executed more than once, to add multiple trustpoints to the application.

The **no** version of this command removes one or more trustpoints from the list of trustpoints associated with the application.

Syntax `server trustpoint [<trustpoint-list>]`
`no server trustpoint [<trustpoint-list>]`

Parameter	Description
<trustpoint-list>	Specify one or more trustpoints to be added or deleted.

Default By default, no trustpoints are associated with the application.

Mode RadSecProxy AAA Configuration Mode

Usage notes The device certificate associated with first trustpoint added to the application will be transmitted to remote servers. The certificate received from the remote server must have an issuer chain that terminates with the root CA certificate for any of the trustpoints that are associated with the application.

If no trustpoints are specified in the command, the trustpoint list will be unchanged.

If **no server trustpoint** is issued without specifying any trustpoints, then all trustpoints will be disassociated from the application.

Example You can add multiple trustpoints to the RadSecProxy AAA application by executing the command multiple times:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy aaa
awplus(config-radsecproxy-aaa)# server trustpoint example_1
awplus(config-radsecproxy-aaa)# server trustpoint example_2
```

Alternatively, add multiple trustpoints with a single command:

```
awplus(config-radsecproxy-aaa)# server trustpoint example_3
example_4
```

Disassociate all trustpoints from the RadSecProxy AAA application using the command:

```
awplus(config-radsecproxy-aaa)# no server trustpoint
```

Related **proxy-port**
commands **radius-secure-proxy aaa**
server (radsecproxy-aaa)
server name-check

show aaa local user locked

Overview This command displays the failed attempts against each user account attempting to login into the device, along with the failure times and locations.

Use this command's output to see if a user is currently locked out or not. You can check:

- the number of login attempts that have a 'V' in the 'Valid' column, and
- if the last attempt happened within the lockout time. If the number of 'V' attempts exceeds the maximum allowed number of attempts, and the last attempt is within the lockout time, then the user is locked out.

The maximum number of attempts is 5 by default. You can change it using the command **aaa local authentication attempts max-fail**.

The lockout time is 5 minutes by default. You can change it using the command **aaa local authentication attempts lockout-time**.

Once a user's lockout status is cleared, this command will no longer display any failed attempts for that user. The status gets cleared by:

- being manually cleared by another privileged user, using the **clear aaa local user lockout** command, or
- the locked out user successfully logs into the system after waiting for the lockout time to pass.

In the Valid column:

- 'V' means this login attempt counts towards the maximum allowed number of attempts
- 'I' means this login attempt does not count towards the maximum allowed number of attempts, because it was more than 15 minutes ago.

Syntax show aaa local user locked

Mode User Exec and Privileged Exec

Example To display the current failed attempts for local users, use the command:

```
awplus# show aaa local user locked
```

Output The following shows typical output.

Example output from the show aaa local user locked command

```
awplus#show aaa local user locked
manager:
When                Type  Source                Valid
2023-02-09 11:48:15 RHOST 192.168.5.1          V
2023-02-09 11:48:21 RHOST 192.168.5.1          V
user1:
When                Type  Source                Valid
2023-02-09 11:47:28 RHOST 192.168.5.1          V
2023-02-09 11:47:31 TTY   /dev/ttyS0           V
2023-02-09 11:47:35 TTY   /dev/ttyS0           V
2023-02-09 11:47:38 RHOST 192.168.5.1          V
2023-02-09 11:47:49 RHOST 192.168.5.1          V
2023-02-09 11:20:50 TTY   /dev/ttyS0           I
2023-02-09 11:20:54 RHOST 192.168.5.1          I
2023-02-09 11:47:19 RHOST 192.168.5.1          V
2023-02-09 11:47:23 TTY   /dev/ttyS0           V
user2:
When                Type  Source                Valid
2023-02-09 11:47:52 TTY   /dev/ttyS0           V
2023-02-09 11:47:55 RHOST 192.168.5.1          V
2023-02-09 11:47:58 TTY   /dev/ttyS0           V
2023-02-09 11:48:05 RHOST 192.168.5.1          V
2023-02-09 11:22:51 RHOST 192.168.5.1          I
2023-02-09 11:22:54 TTY   /dev/ttyS0           I
user3:
When                Type  Source                Valid
2023-02-09 11:38:58 TTY   /dev/ttyS0           V
2023-02-09 11:39:04 RHOST 192.168.5.1          V
2023-02-09 11:39:06 TTY   /dev/ttyS0           V
2023-02-09 11:39:22 RHOST 192.168.5.1          V
2023-02-09 11:39:26 TTY   /dev/ttyS0           V
```

This output example was run at 11:49. The lockout-time and max-fail settings are set to their defaults:

- manager: is not locked out because they only have 2 valid attempts.
- user1: is locked out because they have 7 valid attempts and the most recent was within the lockout time.
- user2: is not locked out because only 4 attempts are valid.
- user3: is not locked out. Even though they have 5 valid attempts, the most recent attempt is older than the lockout time of 5 minutes.

Related commands [aaa local authentication attempts lockout-time](#)
[aaa local authentication attempts max-fail](#)
[clear aaa local user lockout](#)

show aaa server group

Overview Use this command to list AAA users and any method lists applied to them.

Syntax show aaa server group

Mode Privileged Exec

Example To show the AAA configuration on a device, use the command:

```
awplus# show aaa server group
```

Output The following shows typical output.

Example output from show aaa server group

awplus#show aaa server group					
User		List Name	Method		Acct-Event
login	auth	default	-	local	-
cmd-1	auth	-	-	-	-
cmd-7	auth	-	-	-	-
cmd-15	auth	-	-	-	-
login	acct	-	-	-	-
dot1x	auth	default	radius	group	-
dot1x	acct	vlan30_acct	rad_group_4	group	start-stop
auth-mac	auth	default	radius	group	-
auth-mac	acct	vlan10_acct	rad_group_vlan10	group	start-stop
auth-web	auth	default	radius	group	-
auth-web	acct	default	rad_group_3	group	start-stop
isakmp	auth	default	radius	group	-

Related commands

- [aaa accounting auth-mac](#)
- [aaa accounting auth-web](#)
- [aaa accounting dot1x](#)
- [aaa accounting auth-mac](#)
- [aaa authentication auth-web](#)
- [aaa authentication dot1x](#)

show debugging aaa

Overview Use this command to see what debugging is turned on for AAA (Authentication, Authorization, Accounting).

Syntax show debugging aaa

Mode User Exec and Privileged Exec

Example To display the current debugging status of AAA, use the command:
awplus# show debug aaa

Output The following shows typical output.

Example output from the show debug aaa command

```
AAA debugging status:  
Authentication debugging is on  
Accounting debugging is off
```

show radius server group

Overview Use this command to show the RADIUS server group configuration.

Syntax show radius server group [*<group-name>*]

Parameter	Description
<i><group-name></i>	RADIUS server group name.

Default Command name is set to something by default.

Mode Privileged Exec

Usage Use this command with the *<group-name>* parameter to display information for a specific RADIUS server group, or without the parameter to display information for all RADIUS server groups.

Example To display information for all RADIUS server groups, use the command:

```
awplus# show radius server group
```

To display a information for a RADIUS server group named 'rad_group_list1', use the command:

```
awplus# show radius server group rad_group_list1
```


Output The following shows typical output.

Example output from show radius server group

```
awplus#show radius server group
RADIUS Group Configuration
  Group Name : radius#
    Server Host/   Auth  Acct  Auth  Acct
    IP Address     Port  Port  Status Status
    -----
    192.168.1.101  1812 1813  Active Active
    192.168.1.102  1812 1813  Active Active

  Group Name : rad_group_list1
    Server Host/   Auth  Acct  Auth  Acct
    IP Address     Port  Port  Status Status
    -----
    192.168.1.101  1812 1813  Active Active

  Group Name : rad_group_list2
    Server Host/   Auth  Acct  Auth  Acct
    IP Address     Port  Port  Status Status
    -----
    192.168.1.102  1812 1813  Active Active
```

Example output from show radius server group rad_group_list1

```
awplus#show radius server group rad_group_list1
RADIUS Group Configuration
  Group Name : rad_group_list1
    Server Host/   Auth  Acct  Auth  Acct
    IP Address     Port  Port  Status Status
    -----
    192.168.1.101  1812 1813  Active Active
```

Related commands [aaa group server](#)

undebbug aaa

Overview This command applies the functionality of the **no debug aaa** .

45

Lightweight Directory Access Protocol (LDAP) Commands

- Contents**
- **Introduction** on page 2360
 - **authentication (ldap-server)** on page 2361
 - **base-dn** on page 2363
 - **bind authenticate root-dn** on page 2365
 - **deadtime (ldap-server)** on page 2366
 - **debug ldap client** on page 2367
 - **group-attribute** on page 2369
 - **group-dn** on page 2370
 - **host (ldap-server)** on page 2371
 - **ldap-server** on page 2373
 - **login-attribute** on page 2375
 - **port (ldap-server)** on page 2377
 - **retransmit (ldap-server)** on page 2379
 - **search-filter** on page 2380
 - **secure cipher (ldap-server)** on page 2382
 - **secure mode (ldap-server)** on page 2384
 - **secure trustpoint (ldap-server)** on page 2386
 - **server (ldap-group)** on page 2387
 - **show ldap server group** on page 2388
 - **timeout (ldap-server)** on page 2390

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Lightweight Directory Access Protocol (LDAP).

LDAP is an authentication protocol that facilitates user access to various IT resources e.g. applications, servers, networking equipment, and file servers.

It can be used to connect to internal networks over OpenVPN. Although both LDAP and RADIUS are interchangeable on AlliedWare Plus devices as an authentication protocol, LDAP is added because of its ability to interact with directory services such as Microsoft's Active Directory (AD).

For more information, see the **LDAP Feature Overview and Configuration Guide**.

authentication (ldap-server)

Overview Use this command to set the authentication method used to authenticate users against the Lightweight Directory Access Protocol (LDAP) server.

Use the **no** variant of this command to reset the authentication method to **search**.

Syntax authentication {search|bind-only}
no authentication

Parameter	Description
search	The search method initially binds to the LDAP server, then searches for the user, then binds to the user using the DN found with the search. The initial bind is either anonymous, or using the user specified with the bind authenticate root-dn command.
bind-only	The bind-only method attempts to bind to the LDAP server using a predicted DN based on the username, the user attribute (set with the login-attribute command) and the base DN (set with the base-dn command). The format of this user DN is as follows: '<username>=<login-attribute>,<base-dn>'.

Default Search

Mode LDAP Server Configuration

Example To set the authentication method to bind-only for the LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# authentication bind-only
```

To reset the authentication method to the default (search) for 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no authentication
```

Related commands **base-dn**
 bind authenticate root-dn
 ldap-server
 login-attribute
 search-filter

Command changes Version 5.5.2-1.1: command added

base-dn

Overview Use this command to set the base DN (Distinguished Name) of the LDAP server.

When using 'search' authentication, the base DN is the LDAP server's starting point to search for the user within the directory.

If 'bind-only' authentication is enabled, then the base DN is the suffix of the DN that is used to bind to the user.

Use the **no** variant of this command to remove the configured base DN.

Syntax base-dn <base-dn>
no base-dn

Parameter	Description
<base-dn>	The base DN of the LDAP server.

Default Not set

Mode LDAP Server Configuration

Example To set the base DN for the LDAP server called 'Server1' to 'dc=example, dc=com', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# base-dn dc=example,dc=com
```

To clear the base DN for Server1, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no base-dn
```

Related commands

- [authentication \(ldap-server\)](#)
- [bind authenticate root-dn](#)
- [group-attribute](#)
- [group-dn](#)
- [ldap-server](#)
- [login-attribute](#)
- [search-filter](#)

Command changes Version 5.5.2-1.1: command added

bind authenticate root-dn

Overview Use this command to set the authenticated user to bind to when searching for a user on an LDAP server. Do not set this option if you wish to use anonymous binding with the 'search' method.

This option is ignored with the 'bind-only' authentication method.

Use the **no** variant of this command to unset the authenticated user.

Syntax bind authenticate root-dn <user-dn> password <password>
no bind authenticate root-dn

Parameter	Description
<user-dn>	The DN of the authenticated user to bind to.
<password>	The password of the authenticated user.

Default Not set

Mode LDAP Server Configuration

Example To set the authenticated user to 'cn=admin,dc=example,dc=com' with the password '12345678' for the LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# bind authenticate root-dn
cn=admin,dc=example,dc=com password 12345678
```

Related commands [authentication \(ldap-server\)](#)
[base-dn](#)
[group-attribute](#)
[ldap-server](#)
[login-attribute](#)
[search-filter](#)

Command changes Version 5.5.2-1.1: command added

deadtime (ldap-server)

Overview Use this command to configure the deadtime for an LDAP server. The configured deadtime is how long in seconds before an unresponsive LDAP server is considered dead.

Use the **no** variant of this command to remove the deadtime configured on an LDAP server. When you remove the deadtime, the server will never be considered dead.

Syntax deadtime <0-1440>
no deadtime

Parameter	Description
<0-1440>	The number of seconds that the server can be unresponsive for before it is considered dead.

Default 0 seconds (the LDAP server is never considered dead)

Mode LDAP Server Configuration

Example To set the deadtime to 20 seconds for the LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# deadtime 20
```

To reset the deadtime to the default for 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no deadtime
```

Related commands [host \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[retransmit \(ldap-server\)](#)
[show ldap server group](#)
[timeout \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

debug ldap client

Overview Use this command to enable LDAP debugging.
Use the **no** variant of this command to disable all LDAP debugging.

Syntax debug ldap client all
debug ldap client {[acl] [args] [ber] [config] [conns] [filter]
[packets] [parse] [shell] [stats] [stats2] [sync] [trace]}
no debug ldap client

Parameter	Enable or disable debugging for ...
all	All LDAP debugging options
acl	Access Control List processing
args	Heavy trace debugging (args, arguments)
ber	Print out packets sent and received (ber, Bit Error Rate)
config	Configuration processing
conns	Connection management
filter	Search filter processing
packets	Debug packet handling
parse	Parsing processing
shell	Print communication with shell backends
stats	Stats from connections, operations and results
stats2	Stats from log entries sent
sync	Syncrepl consumer processing (LDAP Sync replication)
trace	Trace function calls

Default By default, all LDAP debugging is disabled.

Mode Global Configuration

Example To turn on all LDAP debugging, use the command:

```
awplus# debug ldap client all
```

To turn on filter and packet LDAP debugging, use the command:

```
awplus# debug ldap client filter packets
```

To disable all LDAP debugging, use the command:

```
awplus# no debug ldap client
```

Related commands [aaa authentication login](#)
[aaa group server](#)
[ldap-server](#)

Command changes Version 5.5.2-1.1: command added

group-attribute

Overview Use this command to configure the name of the attribute that group members are stored in.

It is only necessary to set this option if **group-dn** is used and you don't want to use the default attribute, which is 'uniquemember'.

Use the **no** variant of this command to revert to the default group attribute.

Syntax group-attribute <attribute>
no group-attribute

Parameter	Description
<attribute>	The attribute that group members are stored in.

Default The default group attribute is 'uniquemember'.

Mode LDAP Server Configuration

Example To set the group attribute for the LDAP server called 'Server1' to 'member', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# group-attribute member
```

To reset the group attribute to default for 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no group-attribute
```

Related commands

- base-dn**
- bind authenticate root-dn**
- group-dn**
- ldap-server**
- login-attribute**
- search-filter**

Command changes Version 5.5.2-1.1: command added

group-dn

Overview Use this command to configure the group DN (Distinguished Name) of the group that users should be a member of.

By default the device will determine this by checking the 'uniquemember' attribute of the group to see if it contains the user's DN string. This can be changed with the [group-attribute](#) command.

Use the **no** variant of this command to remove the configured group DN.

Syntax group-dn <group-dn>
no group-dn

Parameter	Description
<group-dn>	The DN of the group that users should be a member of.

Default Not set

Mode LDAP Server Configuration

Example To set the group DN for the LDAP server called 'Server1' to 'cn=Users,dc=example,dc=com', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# group-dn cn=Users,dc=example, dc=com
```

To clear the group DN for 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no group-dn
```

Related commands [base-dn](#)
[bind authenticate root-dn](#)
[group-attribute](#)
[ldap-server](#)
[login-attribute](#)
[search-filter](#)

Command changes Version 5.5.2-1.1: command added

host (ldap-server)

Overview Use this command to configure the address of the remote LDAP server you want to connect to.

Use the **no** variant of this command to remove the remote LDAP server.

Syntax host {<host-name>|<ip-address>|<ipv6-address>}
no host

Parameter	Description
<hostname>	The hostname of the LDAP server.
<ip-address>	The IPv4 address of the LDAP server. Uses the format A.B.C.D.
<ipv6-address>	The IPv6 address of the LDAP server. Uses the format x:x::x:x.

Default Not set

Mode LDAP Server Configuration

Example To set the host for the LDAP server called 'Server1' to the IP address 10.0.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# host 10.0.0.1
```

To set the host for Server1 to the IPv6 address 2001:0db8::a2, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# host 2001:db8::a2
```

To set the host for Server1 to the hostname www.ldapserver.com, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# host www.ldapserver.com
```

To unset the host for Server1, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no host
```

Related commands **ldap-server**
port (ldap-server)
retransmit (ldap-server)
secure mode (ldap-server)
secure cipher (ldap-server)
show ldap server group
secure trustpoint (ldap-server)
timeout (ldap-server)

Command changes Version 5.5.2-1.1: command added

ldap-server

Overview Use this command to configure an LDAP server and enter LDAP server configuration mode.

Use the **no** variant of this command to remove the specified server.

Syntax ldap-server <server-name>
no ldap-server <server-name>

Parameter	Description
<server-name>	The name of the LDAP server.

Default Not set

Mode Global Configuration

Example To create and configure an LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)#
```

To configure the LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)#
```

To remove an LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# no ldap-server Server1
```

Related commands

- [authentication \(ldap-server\)](#)
- [host \(ldap-server\)](#)
- [port \(ldap-server\)](#)
- [retransmit \(ldap-server\)](#)
- [secure cipher \(ldap-server\)](#)
- [secure mode \(ldap-server\)](#)
- [secure trustpoint \(ldap-server\)](#)
- [show ldap server group](#)
- [timeout \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

login-attribute

Overview Use this command to set the name of the attribute user names are stored in. The device will search this attribute for the user's DN (Distinguished Name).

It is only necessary to set this option if you don't want to use the default attribute, which is 'uid'.

If the authentication method is 'bind-only', then this attribute is used as the first component of the user DN, with the base DN added to complete the user DN.

Use the **no** variant of this command to reset the login attribute to the default of 'uid'.

Syntax login-attribute <attribute>
no login-attribute

Parameter	Description
<attribute>	The LDAP attribute to use for the username of connecting users.

Default uid

Mode LDAP Server Configuration

Example To set the login attribute for the LDAP server called 'Server1' to 'sAMAccountName', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# login-attribute sAMAccountName
```

To reset the login attribute for 'Server1' to the default, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no login-attribute
```

Related command **authentication (ldap-server)**
base-dn
bind authenticate root-dn
group-attribute
group-dn
ldap-server
search-filter

Command changes Version 5.5.2-1.1: command added

port (ldap-server)

Overview Use this command to configure the port you are using to connect to the remote LDAP server.

Note that if secure ciphers are enabled, then the secure port is used instead. Secure ciphers are configured with the **secure mode (ldap-server)** command.

Use the **no** variant of this command to reset the port number to the default (389).

Syntax port <1-65535>
no port

Parameter	Description
<1-65535>	Port number from 1 through 65535.

Default 389

Mode LDAP Server Configuration

Example To set the port for the LDAP server called 'Server1' to 1579, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# port 1579
```

To reset the port for 'Server1' to the default of 389, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no port
```

Related commands	deadtime (ldap-server)
	host (ldap-server)
	ldap-server
	retransmit (ldap-server)
	secure cipher (ldap-server)
	secure mode (ldap-server)
	secure trustpoint (ldap-server)
	show ldap server group
Command changes	timeout (ldap-server)
	Version 5.5.2-1.1: command added

retransmit (ldap-server)

Overview Use this command to configure the number of times a device will attempt to reconnect to the LDAP server before aborting.

Use the **no** variant of this command to reset the reconnect attempts to the default value of 3.

Syntax retransmit <0-100>
no retransmit

Parameter	Description
<0-100>	The number of times the device will attempt to reconnect to the LDAP server.

Default 3 times

Mode LDAP Server Configuration

Example To set the number of reconnect attempts for the LDAP server called 'Server1' to 5 attempts, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# retransmit 5
```

To reset the number of reconnect attempts for 'Server1' to 3 attempts, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no retransmit
```

Related commands [deadtime \(ldap-server\)](#)
[host \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[timeout \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

search-filter

Overview Use this command to add a filter to use when searching for a user on the LDAP server.

The filter should be a form similar to 'attribute=value' or '&(attribute1=value1)(attribute2=value2)

Use the **no** variant of this command to remove the search filter.

Syntax search-filter <filter>
no search-filter

Parameter	Description
<filter>	The filter to use when searching for a user.

Default Not set

Mode LDAP Server Configuration

Usage notes If the 'bind-only' authentication method is used, then this value is unused.
For the search authentication method, a search operation is used to search the LDAP server. The client specifies the starting point (base DN) of the search, the search scope (either the object, its children, or the subtree rooted at the object), and a search filter.

Example To set a search filter on the LDAP server called 'Server1' to 'building=block1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# search-filter building=block1
```

To unset the search filter of 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no search-filter
```


Related commands **authentication (ldap-server)**
base-dn
bind authenticate root-dn
group-attribute
group-dn
ldap-server
login-attribute

Command changes Version 5.5.2-1.1: command added

secure cipher (ldap-server)

Overview Use this command to configure the OpenSSL ciphers used in LDAP secure mode. You can choose groups of ciphers from a number of Mozilla TLS configs, or specify multiple individual ciphers in OpenSSL format.

Use the **no** variant of this command to remove the configured ciphers on a server.

Syntax secure cipher {old|intermediate|modern}
secure cipher <cipher-list>
no secure cipher

Parameter	Description
old	Ciphers in Mozilla's old TLS config. Alongside the modern and intermediate ciphers, this includes the following ciphers: DHE-RSA-CHACHA20-POLY1305,ECDHE-ECDSA-AES128SHA256, ECDHE-RSA-AES128-SHA256,ECDHE-ECDSA-AES128-SHA, ECDHE-RSA-AES128-SHA,ECDHE-ECDSA-AES256-SHA384, ECDHE-RSA-AES256-SHA384, ECDHE-ECDSA-AES256-SHA, ECDHE-RSA-AES256-SHA,DHE-RSA-AES128-SHA256, DHE-RSA-AES256-SHA256, AES128-GCM-SHA256, AES256-GCM-SHA384,AES128-SHA256, AES256-SHA256, AES128-SHA, AES256-SHA, DES-CBC3-SHA
intermediate	Ciphers in Mozilla's intermediate TLS config. Alongside the modern ciphers, this includes the following ciphers: ECDHE-ECDSA-AES128-GCM-SHA256,ECDHE-RSA-AES128-CM-SHA256, ECDHE-ECDSA-AES256-GCM-SHA384,ECDHE-RSA-AES256-CM-SHA384, ECDHE-ECDSA-CHACHA20-POLY1305,ECDHE-RSA-CHACHA20-POLY1305, DHE-RSA-AES128-GCM-SHA256,DHE-RSA-AES256-GCM-SHA384
modern	Ciphers in Mozilla's modern TLS config. Includes the following ciphers: TLS_AES_128_GCM_SHA256, TLS_AES_256_GCM_SHA384, TLS_CHACHA20_POLY1305_SHA256
<cipher-list>	The name (or names) of a cipher in OpenSSL format. This is a space separated list of cipher names, for example: DHE-DSS-AES256-GCM-SHA384 TLS_AES_256_GCM_SHA384

Default Not set

Mode LDAP Server Configuration

Example To use the Intermediate Mozilla cipher suite on the LDAP server called Server1, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# secure cipher intermediate
```

To remove the configured ciphers on 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no secure cipher
```

To use the ciphers DHE-DSS-AES256-GCM-SHA384 and TLS_AES_256_GCM_SHA384 on 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# secure cipher DHE-DSS-AES256-GCM-SHA384 TLS_AES_256_GCM_SHA384
```

Related commands [host \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[secure mode \(ldap-server\)](#)
[secure trustpoint \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

secure mode (ldap-server)

Overview Use this command to configure the LDAP server to use secure mode. Secure mode encrypts communications with the LDAP server using TLS (Transport Layer Security). If you don't specify a port number, the default port (636) is used.

For secure mode, you should also set the CA certificate using the **secure trustpoint (ldap-server)** command.

Use **no secure mode** to disable secure mode for communicating with this LDAP server.

Use **no secure mode secure-port** to reset the secure mode port to the default.

Syntax secure mode [secure-port <port>]
no secure mode
no secure mode secure-port

Parameter	Description
<port>	The secure port for communicating with the LDAP server

Default Secure mode is disabled, and the default port is 636

Mode LDAP Server Configuration

Example To enable secure mode for communicating with the LDAP server called 'Server1', with the default port, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# secure mode
```

To disable secure mode for communicating with 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no secure mode
```

To enable secure mode with the port 1234 for communicating with 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# secure mode secure-port 1234
```

To reset the secure mode port to the default on 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no secure mode secure-port
```

Related commands

- host (ldap-server)**
- ldap-server**
- port (ldap-server)**
- secure cipher (ldap-server)**
- secure trustpoint (ldap-server)**

Command changes Version 5.5.2-1.1: command added

secure trustpoint (ldap-server)

Overview Use this command to link a preconfigured trustpoint to the LDAP server configuration. The trustpoint must be the LDAP server certificate and is required to successfully connect to the LDAP server when secure mode is enabled.

Use the **no** variant of this command to remove a trustpoint from an LDAP server.

Syntax secure trustpoint <trustpoint>
no secure trustpoint

Parameter	Description
<trustpoint>	The name of the trustpoint used for LDAP secure mode

Default Not set

Mode LDAP Server Configuration

Example To set the trustpoint to Trustpoint1 for the LDAP server called 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap server Server1
awplus(config-ldap-server)# secure trustpoint Trustpoint1
```

To remove the trustpoint from 'Server1', use the commands:

```
awplus# configure terminal
awplus(config)# ldap server Server1
awplus(config-ldap-server)# no secure trustpoint
```

Related commands [host \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[secure cipher \(ldap-server\)](#)
[secure mode \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

server (ldap-group)

Overview Use this command to add an LDAP server to an LDAP server group.

The server is identified by the name of the server, which is created using the **ldap-server** command.

Use the **no** variant of this command to remove an LDAP server from an LDAP server group.

Syntax server <server-name>
no server <server-name>

Parameter	Description
<server-name>	The name of the LDAP server group, specified when creating the LDAP server.

Default By default, LDAP servers are only added to the default 'ldap' server group.

Mode LDAP Server Group Configuration

Usage notes The server is appended to the server list of the group, and the order of configuration determines the precedence of servers.

Example To add the LDAP server called 'Server1' to the LDAP server group called 'Group1', use the commands:

```
awplus# configure terminal
awplus(config)# aaa group server ldap Group1
awplus(config-ldap-group)# server Server1
```

To remove 'Server1' from 'Group1', use the commands:

```
awplus# configure terminal
awplus(config)# aaa group server ldap Group1
awplus(config-ldap-group)# no server Server1
```

Related commands [aaa authentication login](#)
[aaa group server](#)
[ldap-server](#)
[show ldap server group](#)

Command changes Version 5.5.2-1.1: command added

show ldap server group

Overview Use this command to display information about LDAP server groups, their servers and the status of those servers.

Syntax show ldap server group [<group-name>]

Parameter	Description
<group-name>	The name of the LDAP server group.

Mode Global Configuration

Usage notes If you specify a single group name, you will only see information relating to that specific server group. Otherwise, all LDAP server groups are shown, including the 'ldap' group that contains every LDAP server.

Example To show all server groups, use the command:

```
awplus# show ldap server group
```

To show the default LDAP group that includes all the LDAP servers, use the command:

```
awplus# show ldap server group ldap
```

To show a server group named 'CustomGroup1', use the command:

```
awplus# show ldap server group CustomGroup1
```

Output The following shows typical output.

Example output from show ldap server group

LDAP Group Configuration				
Group Name : ldap				
LDAP server name	Server Host/IP Address	Port	Status	

server_one	10.1.1.1	N/A	Alive	
server_two	10.2.1.1	N/A	Dead (1 hour)	
Group Name : CustomGroup1				
LDAP server name	Server Host/IP Address	Port	Status	

server_one	10.1.1.1	N/A	Alive	
Group Name : CustomGroup2				
LDAP server name	Server Host/IP Address	Port	Status	

No LDAP servers currently defined				

Related commands [aaa authentication login](#)
[aaa group server](#)
[deadtime \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[server \(ldap-group\)](#)

Command changes Version 5.5.2-1.1: command added

timeout (ldap-server)

Overview Use this command to set the time to wait for a connection before reattempting to connect to the LDAP server.

Use the **no** variant of this command to reset the timeout back to the default value.

Syntax timeout <1-1000>
no timeout

Parameter	Description
<1-1000>	The number of seconds to wait for a connection before reattempting to connect to the LDAP server.

Default 5 seconds

Mode LDAP Server Configuration

Example To set the server timeout for the LDAP server called 'Server1' to 10 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# timeout 10
```

To set the server timeout for 'Server1' to the default, use the commands:

```
awplus# configure terminal
awplus(config)# ldap-server Server1
awplus(config-ldap-server)# no timeout
```

Related commands [deadtime \(ldap-server\)](#)
[host \(ldap-server\)](#)
[ldap-server](#)
[port \(ldap-server\)](#)
[retransmit \(ldap-server\)](#)

Command changes Version 5.5.2-1.1: command added

46

RADIUS Commands

- Contents**
- **Introduction** on page 2392
 - **auth-mac-promiscuous** on page 2393
 - **auth radius send nas-identifier** on page 2394
 - **auth radius send service-type** on page 2395
 - **clear radius dynamic-authorization counters** on page 2396
 - **deadtime (RADIUS server group)** on page 2397
 - **debug radius** on page 2398
 - **ip radius require-message-authenticator** on page 2399
 - **ip radius source-interface** on page 2400
 - **radius dynamic-authorization-client** on page 2401
 - **radius-server deadtime** on page 2403
 - **radius-server host** on page 2405
 - **radius-server key** on page 2410
 - **radius-server retransmit** on page 2412
 - **radius-server timeout** on page 2414
 - **server (RADIUS server group)** on page 2416
 - **show debugging radius** on page 2419
 - **show radius** on page 2420
 - **show radius dynamic-authorization counters** on page 2423
 - **show radius local-server auth-mac-promiscuous** on page 2425
 - **show radius statistics** on page 2426
 - **undebg radius** on page 2427

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure the device as a RADIUS client.

For more information, see the [RADIUS Feature Overview and Configuration Guide](#).

auth-mac-promiscuous

Overview Use this command to enable promiscuous mode for MAC address authentication on a local RADIUS server.

Use the **no** variant of this command to disable MAC authentication promiscuous mode on a local RADIUS server.

Syntax auth-mac-promiscuous
no auth-mac-promiscuous

Default Disabled.

Mode RADIUS Server Configuration

Usage notes In promiscuous mode, the RADIUS server will respond with an Access-Accept for any Access-Request with a Radius Service-Type attribute of 'Call-Check', when the supplicants credentials are NOT in the user database.

If the credentials do appear in the database, the behavior of the server is unchanged.

Example To disable MAC authentication promiscuous mode on a local RADIUS server, use the commands:

```
awplus# radius-server local  
awplus(config-radsrv)# no auth-mac-promiscuous
```

Related commands [show radius local-server auth-mac-promiscuous](#)

Command changes Version 5.5.3-2.1: command added

auth radius send nas-identifier

Overview Use this command to enable the device to include the NAS-Identifier(32) attribute in RADIUS authentication requests.

Use the **no** variant of this command to stop including the NAS-Identifier attribute.

Syntax `auth radius send nas-identifier {<name>|vlan-id}`
`no auth radius send nas-identifier`

Parameter	Description
<name>	Send this user-defined text as the NAS-Identifier. You can specify up to 253 characters.
vlan-id	Send the VLAN ID of the authentication port as the NAS-Identifier. This is the configured VLAN ID, not the dynamic VLAN ID or guest VLAN ID.

Mode Global Configuration

Example To use a user-defined identifier of NASID100 as the NAS-Identifier attribute, use the commands:

```
awplus# configure terminal
awplus(config)# auth radius send nas-identifier NASID100
```

To use the VLAN ID as the NAS-Identifier attribute, use the commands:

```
awplus# configure terminal
awplus(config)# auth radius send nas-identifier vlan-id
```

To stop sending the NAS-Identifier attribute, use the commands:

```
awplus# configure terminal
awplus(config)# no auth radius send nas-identifier
```

Related commands [auth radius send service-type](#)

auth radius send service-type

Overview Use this command to enable the device to include the Service-Type(6) attribute in RADIUS authentication requests. The Service-Type attribute has a value of:

- Framed(2) for 802.1x
- Call-Check(10) for MAC authentication
- Unbound(5) for Web authentication.

Use the **no** variant of this command to stop including the Service-Type attribute.

Syntax auth radius send service-type
no auth radius send service-type

Mode Global Configuration

Example To send the Service-Type attribute, use the commands:

```
awplus# configure terminal
awplus(config)# auth radius send service-type
```

Related commands [auth radius send nas-identifier](#)

clear radius dynamic-authorization counters

Overview Use this command to set the Dynamic Authorization message counters to zero.

Syntax clear radius dynamic-authorization counters

Mode Privileged Exec

Example To set the Dynamic Authorization message counters to zero, use the command:

```
awplus# clear radius dynamic-authorization counters
```

Related commands [radius dynamic-authorization-client](#)
[show radius dynamic-authorization counters](#)

Command changes Version 5.5.1-1.1: command added

deadtime (RADIUS server group)

Overview Use this command to configure the **deadtime** parameter for the RADIUS server group. This command overrides the global dead-time configured by the **radius-server deadtime**. The configured deadtime is the time period in minutes to skip a RADIUS server for authentication or accounting requests if the server is 'dead'. Note that a RADIUS server is considered 'dead' if there is no response from the server within a defined time period.

Use the **no** variant of this command to reset the deadtime configured for the RADIUS server group. If the global deadtime for RADIUS server is configured the value will be used for the servers in the group. The global deadtime for the RADIUS server is set to 0 minutes by default.

Syntax `deadtime <0-1440>`
`no deadtime`

Parameter	Description
<code><0-1440></code>	Amount of time in minutes.

Default The deadtime is set to 0 minutes by default.

Mode RADIUS Server Group Configuration

Usage If the RADIUS server does not respond to a request packet, the packet is retransmitted the number of times configured for the **retransmit** parameter (after waiting for a **timeout** period to expire). The server is then marked 'dead', and the time is recorded. The **deadtime** parameter configures the amount of time to skip a dead server; if a server is dead, no request message is sent to the server for the **deadtime** period.

Examples To configure the deadtime for 5 minutes for the RADIUS server group 'GROUP1', use the commands:

```
awplus(config)# aaa group server radius GROUP1
awplus(config-sg)# server 192.168.1.1
awplus(config-sg)# deadtime 5
```

To remove the deadtime configured for the RADIUS server group 'GROUP1', use the commands:

```
awplus(config)# aaa group server radius GROUP1
awplus(config-sg)# no deadtime
```

Related commands **aaa group server**
radius-server deadtime

debug radius

Overview This command enables RADIUS debugging. If no option is specified, all debugging options are enabled.

Use the **no** variant of this command to disable RADIUS debugging. If no option is specified, all debugging options are disabled.

Syntax debug radius [packet|event|all]
no debug radius [packet|event|all]

Parameter	Description
packet	Debugging for RADIUS packets is enabled or disabled.
event	Debugging for RADIUS events is enabled or disabled.
all	Enable or disable all debugging options.

Default RADIUS debugging is disabled by default.

Mode Privileged Exec

Examples To enable debugging for RADIUS packets, use the command:

```
awplus# debug radius packet
```

To enable debugging for RADIUS events, use the command:

```
awplus# debug radius event
```

To disable debugging for RADIUS packets, use the command:

```
awplus# no debug radius packet
```

To disable debugging for RADIUS events, use the command:

```
awplus# no debug radius event
```

Related commands [show debugging radius](#)
[undebug radius](#)

ip radius require-message-authenticator

Overview Use this command to configure the RADIUS client to reject unverified RADIUS packets. This means it will discard any received RADIUS Access-Accept, Access-Challenge, and Access-Reject packets that do not have a valid Message-Authenticator attribute.

Use the **no** variant of this command to allow the client to accept unverified RADIUS packets.

Syntax `ip radius require-message-authenticator`
`no ip radius require-message-authenticator`

Default Disabled

Mode Global Configuration

Example To require Message-Authenticator attributes in responses from RADIUS servers, use the commands:

```
awplus# configure terminal
awplus(config)# ip radius require-message-authenticator
```

Related commands [nas message-authenticator \(radsvr\)](#)
[radius-server host](#)
[show radius local-server nas](#)

Command changes Version 5.5.4-2.3: command added

ip radius source-interface

Overview This command configures the source IP address of every outgoing RADIUS packet to use a specific IP address or the IP address of a specific interface. If the specified interface is down or there is no IP address on the interface, then the source IP address of outgoing RADIUS packets depends on the interface the packets leave.

Use the **no** variant of this command to remove the source interface configuration. The source IP address in outgoing RADIUS packets will be the IP address of the interface from which the packets are sent.

Syntax `ip radius source-interface {<interface>|<ip-address>}`
`no ip radius source-interface`

Parameter	Description
<code><interface></code>	Interface name.
<code><ip-address></code>	IP address in the dotted decimal format A.B.C.D.

Default Source IP address of outgoing RADIUS packets depends on the interface the packets leave.

Mode Global Configuration

Examples To configure all outgoing RADIUS packets to use the IP address of the interface "vlan1" for the source IP address, use the following commands:

```
awplus# configure terminal
awplus(config)# ip radius source-interface vlan1
```

To configure the source IP address of all outgoing RADIUS packets to use 192.168.1.10, use the following commands:

```
awplus# configure terminal
awplus(config)# ip radius source-interface 192.168.1.10
```

To reset the source interface configuration for all outgoing RADIUS packets, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip radius source-interface
```

Related commands [radius-server host](#)
[show radius statistics](#)

radius dynamic-authorization-client

Overview Use this command to add a Dynamic Authorization Client (DAC). A Network Access Server (NAS) will only accept Dynamic Authorization (DA) messages from DACs that have been authorized using this command.

Use the **no** variant of this command to remove a DAC from the list of authorized clients.

Syntax radius dynamic-authorization-client <ip-address> key <key-string>

no radius dynamic-authorization-client <ip-address>

When in secure mode (see the **crypto secure-mode** command), the syntax in config files will be:

radius dynamic-authorization-client <ip-address> key-encrypted <encrypted-key-string>

When not in secure mode, the syntax in config files will be:

radius dynamic-authorization-client <ip-address> key <encoded-key-string> encrypted

Parameter	Description
<ip-address>	IP address of the DAC, entered in the form A.B.C.D
key	Sets the shared-key of the client.
key-encrypted	This parameter displays in configuration files when secure mode is enabled. Set an encrypted shared secret key. When secure mode is enabled, the running configuration contains this parameter instead of the key parameter. It indicates that the device stores keys in the running configuration in encrypted form instead of in plain text.
encrypted	This parameter displays in configuration files when secure mode is disabled. Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.

Mode Global Configuration

Usage notes The RADIUS protocol does not support unsolicited messages sent from the RADIUS server to the NAS. This means that the network access configuration a supplicant receives from a RADIUS server cannot be updated until the supplicant re-authenticates with the RADIUS server.

In some situations it is desirable to either update a supplicant's configuration, or even disconnect their session.

This command allows a Dynamic Authentication Client to send a message that will either update or terminate a supplicant's session.

Example To add a DAC with IP address 10.0.0.1, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# radius dynamic-authorization-client 10.0.0.1 key  
secret-key
```

To remove the configuration for a DAC with IP address 10.0.0.1, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no radius dynamic-authorization-client 10.0.0.1
```

Related commands **clear radius dynamic-authorization counters**
show radius dynamic-authorization counters

Command changes Version 5.5.4-0.1: **encrypted** parameter added
Version 5.5.1-1.1: command added

radius-server deadtime

Overview Use this command to specify the global **deadtime** for all RADIUS servers. If a RADIUS server is considered dead, it is skipped for the specified deadtime. This command specifies for how many minutes a RADIUS server that is not responding to authentication requests is passed over by requests for RADIUS authentication.

Use the **no** variant of this command to reset the global deadtime to the default of 0 seconds, so that RADIUS servers are not skipped even if they are dead.

Syntax radius-server deadtime <minutes>
no radius-server deadtime

Parameter	Description
<minutes>	RADIUS server deadtime in minutes in the range 0 to 1440 (24 hours).

Default The default RADIUS deadtime configured on the system is 0 seconds.

Mode Global Configuration

Usage The RADIUS client considers a RADIUS server to be dead if it fails to respond to a request after it has been retransmitted as often as specified globally by the **radius-server retransmit** command or for the server by the **radius-server host** command. To improve RADIUS response times when some servers may be unavailable, set a **deadtime** to skip dead servers.

Examples To set the dead time of the RADIUS server to 60 minutes, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server deadtime 60
```

To disable the dead time of the RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server deadtime
```

Related commands **deadtime (RADIUS server group)**
radius-server host
radius-server retransmit
show radius statistics

radius-server host

Overview Use this command to specify a remote RADIUS server host for authentication or accounting, and to set server-specific parameters. The parameters specified with this command override the corresponding global parameters for RADIUS servers. This command specifies the IP address or host name of the remote RADIUS server host and assigns authentication and accounting destination UDP port numbers.

This command adds the RADIUS server address and sets parameters to the RADIUS server. The RADIUS server is added to the running configuration after you issue this command. If parameters are not set using this command then common system settings are applied.

Use the **no** variant of this command to remove the specified server host as a RADIUS authentication and/or accounting server and set the destination port to the default RADIUS server port number (1812).

Syntax `radius-server host {<host-name>|<ip-address>} [acct-port <0-65535>] [auth-port <0-65535>] [key <key-string>] [encrypted] [retransmit <0-100>] [timeout <1-1000>]`
`no radius-server host {<host-name>|<ip-address>} [acct-port <0-65535>] [auth-port <0-65535>]`

Syntax (Secure Mode) `radius-server host {<host-name>|<ip-address>} [acct-port <0-65535>] [auth-port <0-65535>] [key-encrypted <encrypted-key-string>] [retransmit <0-100>] [timeout <1-1000>]`
`no radius-server host {<host-name>|<ip-address>} [acct-port <0-65535>] [auth-port <0-65535>]`

When in secure mode, the syntax in config files will be:

`radius-server key-encrypted <encrypted-key-string>`

When not in secure mode, the syntax in config files will be:

`radius-server key <encoded-key-string> encrypted`

Parameter	Description
<i><host-name></i>	Server host name. The DNS name of the RADIUS server host.
<i><ip-address></i>	The IP address of the RADIUS server host.
acct-port	Accounting port. Specifies the UDP destination port for RADIUS accounting requests. If 0 is specified, the server is not used for accounting. The default UDP port for accounting is 1813.
<i><0-65535></i>	UDP port number. (Accounting port number is set to 1813 by default) Specifies the UDP destination port for RADIUS accounting requests. If 0 is specified, the host is not used for accounting.
auth-port	Authentication port. Specifies the UDP destination port for RADIUS authentication requests. If 0 is specified, the server is not used for authentication. The default UDP port for authentication is 1812.
<i><0-65535></i>	UDP port number (authentication port number is set to 1812 by default). Specifies the UDP destination port for RADIUS authentication requests. If 0 is specified, the host is not used for authentication.
timeout	Specifies the amount of time to wait for a response from the server. If this parameter is not specified the global value configured by the radius-server timeout command is used.
<i><1-1000></i>	Time in seconds to wait for a server reply (timeout is set to 5 seconds by default). The time interval (in seconds to wait for the RADIUS server to reply before retransmitting a request or considering the server dead. This setting overrides the global value set by the radius-server timeout command. If no timeout value is specified for this server, the global value is used.
retransmit	Specifies the number of retries before skip to the next server. If this parameter is not specified the global value configured by the radius-server retransmit command is used.
<i><0-100></i>	Maximum number of retries (maximum number of retries is set to 3 by default). The maximum number of times to resend a RADIUS request to the server, if it does not respond within the timeout interval, before considering it dead and skipping to the next RADIUS server. This setting overrides the global setting of the radius-server retransmit command. If no retransmit value is specified, the global value is used.

Parameter	Description
key	Set shared secret key with RADIUS servers.
<i><key-string></i>	Shared key string applied. Specifies the shared secret authentication or encryption key for all RADIUS communications between this device and the RADIUS server. This key must match the encryption used on the RADIUS daemon. All leading spaces are ignored. This setting overrides the global setting of the radius-server key command. If no key value is specified, the global value is used.
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
key-encrypted	Set an encrypted shared secret key. When secure mode is enabled, the running configuration contains this parameter instead of the key parameter. It indicates that the device stores keys in the running configuration in encrypted form instead of in plain text.
<i><encrypted-key-string></i>	Encrypted shared key string.

Default The RADIUS client address is not configured (null) by default. No RADIUS server is configured.

Mode Global Configuration

Usage Multiple **radius-server host** commands can be used to specify multiple hosts. The software searches for hosts in the order they are specified. If no host-specific timeout, retransmit, or key values are specified, the global values apply to that host. If there are multiple RADIUS servers for this client, use this command multiple times—once to specify each server.

If you specify a host without specifying the auth port or the acct port, it will by default be configured for both authentication and accounting, using the default UDP ports. To set a host to be a RADIUS server for authentication requests only, set the **acct-port** parameter to 0; to set the host to be a RADIUS server for accounting requests only, set the auth-port parameter to 0.

A RADIUS server is identified by IP address, authentication port and accounting port. A single host can be configured multiple times with different authentication or accounting ports. All the RADIUS servers configured with this command are included in the predefined RADIUS server group radius, which may be used by AAA authentication, authorization and accounting commands. The client transmits (and retransmits, according to the **retransmit** and **timeout** parameters) RADIUS authentication or accounting requests to the servers in the order you specify them, until it gets a response.

Examples To add the RADIUS server 10.0.0.20, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server host 10.0.0.20
```

To set the secret key to 'mySecret' on the RADIUS server 10.0.0.20, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server host 10.0.0.20 key mySecret
```

To delete the RADIUS server 10.0.0.20, use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server host 10.0.0.20
```

To configure rad1.company.com for authentication only, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server host rad1.company.com acct-port 0
```

To remove the RADIUS server rad1.company.com configured for authentication only, use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server host rad1.company.com acct-port
0
```

To configure rad2.company.com for accounting only, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server host rad2.company.com auth-port 0
```

To configure 192.168.1.1 with authentication port 1000, accounting port 1001 and retransmit count 5, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server host 192.168.1.1 auth-port 1000
acct-port 1001 retransmit 5
```

Related commands

- [aaa group server](#)
- [radius-server key](#)
- [radius-server retransmit](#)
- [radius-server timeout](#)
- [show radius statistics](#)

Command changes

- Version 5.5.3-2.1: **encrypted** parameter added
- Version 5.5.2-1.1: **vrf** parameter added for products that support VRF
- Version 5.4.9-2.1: **key-encrypted** parameter added

radius-server key

Overview This command sets a global secret key for RADIUS authentication on the device. The shared secret text string is used for RADIUS authentication between the device and a RADIUS server.

Note that if no secret key is explicitly specified for a RADIUS server, the global secret key will be used for the shared secret for the server.

Use the **no** variant of this command to reset the secret key to the default (null).

Syntax radius-server key *<key-string>*
no radius-server key

When in secure mode, the syntax in config files will be:

radius-server key-encrypted *<encrypted-key-string>*

When not in secure mode, the syntax in config files will be:

radius-server key *<encoded-key-string>* [encrypted]

Parameter	Description
key <i><key-string></i>	Shared secret among RADIUS server and 802.1X client.
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
key-encrypted <i><encrypted-key-string></i>	This parameter indicates that the key is in its encrypted form. You would not normally enter this command. Instead, if you enter key and secure mode is enabled, the running config contains this parameter instead of the key parameter. This indicates that in secure mode the device stores keys in the running config in encrypted form instead of in plain text.

Default The RADIUS server secret key on the system is not set by default (null).

Mode Global Configuration

Usage Use this command to set the global secret key shared between this client and its RADIUS servers. If no secret key is specified for a particular RADIUS server using the **radius-server host** command, this global key is used.

After enabling AAA authentication with the **aaa authentication login** command, set the authentication and encryption key using the **radius-server key** command so the key entered matches the key used on the RADIUS server.

Examples To set the global secret key to **allied** for RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server key allied
```

To set the global secret key to **secret** for RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server key secret
```

To delete the global secret key for RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server key
```

Related commands **radius-server host**
show radius statistics

Command changes Version 5.5.3-2.1: **encrypted** parameter added

radius-server retransmit

Overview This command sets the retransmit counter to use RADIUS authentication on the device. This command specifies how many times the device transmits each RADIUS request to the RADIUS server before giving up.

This command configures the **retransmit** parameter for RADIUS servers globally. If the **retransmit** parameter is not specified for a RADIUS server by the **radius-server host** command then the global configuration set by this command is used for the server instead.

Use the **no** variant of this command to reset the re-transmit counter to the default (3).

Syntax radius-server retransmit <retries>
no radius-server retransmit

Parameter	Description
<retries>	RADIUS server retries in the range <0-100>. The number of times a request is resent to a RADIUS server that does not respond, before the server is considered dead and the next server is tried. If no retransmit value is specified for a particular RADIUS server using the radius-server host command, this global value is used.

Default The default RADIUS retransmit count on the device is 3.

Mode Global Configuration

Examples To set the RADIUS **retransmit** count to 1, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server retransmit 1
```

To set the RADIUS **retransmit** count to the default (3), use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server retransmit
```

To configure the RADIUS **retransmit** count globally with 5, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server retransmit 5
```

To disable retransmission of requests to a RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server retransmit 0
```

Related commands [radius-server deadtime](#)
[radius-server host](#)
[show radius statistics](#)

radius-server timeout

Overview Use this command to specify the RADIUS global timeout value. This is how long the device waits for a reply to a RADIUS request before retransmitting the request, or considering the server to be dead. If no timeout is specified for the particular RADIUS server by the **radius-server host** command, it uses this global timeout value.

Note that this command configures the **timeout** parameter for RADIUS servers globally.

The **no** variant of this command resets the transmit timeout to the default (5 seconds).

Syntax radius-server timeout <seconds>
no radius-server timeout

Parameter	Description
<seconds>	RADIUS server timeout in seconds in the range 1 to 1000. The global time in seconds to wait for a RADIUS server to reply to a request before retransmitting the request, or considering the server to be dead (depending on the radius-server retransmit command).

Default The default RADIUS transmit timeout on the system is 5 seconds.

Mode Global Configuration

Examples To globally set the device to wait 20 seconds before retransmitting a RADIUS request to unresponsive RADIUS servers, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server timeout 20
```

To set the RADIUS **timeout** parameter to 1 second, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server timeout 1
```

To set the RADIUS **timeout** parameter to the default (5 seconds), use the following commands:

```
awplus# configure terminal
awplus(config)# no radius-server timeout
```

To configure the RADIUS server **timeout** period globally with 3 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server timeout 3
```

To reset the global **timeout** period for RADIUS servers to the default, use the following command:

```
awplus# configure terminal
awplus(config)# no radius-server timeout
```

Related commands

- [radius-server deadtime](#)
- [radius-server host](#)
- [radius-server retransmit](#)
- [show radius statistics](#)

server (RADIUS server group)

Overview This command adds a RADIUS server to a server group in RADIUS Server Group Configuration mode. The RADIUS server should be configured by the **radius-server host** command.

The device adds each server to the end of the group's list of servers, so add the servers in order of priority. If you add a server and it is already in the list, it will be removed and then re-added to the end of the list.

The server is identified by IP address and authentication and accounting UDP port numbers. So a RADIUS server can have multiple entries in a group with different authentication and/or accounting UDP ports. The **auth-port** specifies the UDP destination port for authentication requests to the server. To disable authentication for the server, set **auth-port** to 0. If the authentication port is missing, the default port number is 1812. The **acct-port** specifies the UDP destination port for accounting requests to the server. To disable accounting for the server, set **acct-port** to 0. If the accounting port is missing, the default port number is 1813.

Use the **no** variant of this command to remove a RADIUS server from the server group.

Syntax `server {<hostname>|<ip-address>} [auth-port <0-65535>] [acct-port <0-65535>]`
`no server {<hostname>|<ip-address>} [auth-port <0-65535>] [acct-port <0-65535>]`

Parameter	Description
<hostname>	Server host name
<ip-address>	Server IP address The server is identified by IP address, authentication and accounting UDP port numbers. So a RADIUS server can have multiple entries in a group with different authentication and/or accounting UDP ports.
auth-port	Authentication port The auth-port specifies the UDP destination port for authentication requests to the server. To disable authentication for the server, set auth-port to 0. If the authentication port is missing, the default port number is 1812.
<0-65535>	UDP port number (default: 1812)
acct-port	Accounting port The acct-port specifies the UDP destination port for accounting requests to the server. To disable accounting for the server, set acct-port to 0. If the accounting port is missing, the default port number is 1813.
<0-65535>	UDP port number (default: 1813)

Default The default Authentication port number is 1812 and the default Accounting port number is 1813.

Mode RADIUS Server Group Configuration

Usage notes The RADIUS server to be added must be configured by the **radius-server host** command. In order to add or remove a server, the **auth-port** and **acct-port** parameters in this command must be the same as the corresponding parameters in the **radius-server host** command.

Examples To create a RADIUS server group 'RAD_AUTH1' for authentication, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa group server radius RAD_AUTH1
awplus(config-sg)# server 192.168.1.1 acct-port 0
awplus(config-sg)# server 192.168.2.1 auth-port 1000 acct-port
0
```

To create a RADIUS server group 'RAD_ACCT1' for accounting, use the following commands:

```
awplus# configure terminal
awplus(config)# aaa group server radius RAD_ACCT1
awplus(config-sg)# server 192.168.2.1 auth-port 0 acct-port 1001
awplus(config-sg)# server 192.168.3.1 auth-port 0
```

To remove server 192.168.3.1 from the existing server group 'GROUP1', use the following commands:

```
awplus# configure terminal
awplus(config)# aaa group server radius GROUP1
awplus(config-sg)# no server 192.168.3.1
```

Related commands

- [aaa accounting auth-web](#)
- [aaa accounting auth-mac](#)
- [aaa accounting dot1x](#)
- [aaa accounting login](#)
- [aaa authentication auth-mac](#)
- [aaa authentication auth-web](#)
- [aaa authentication login](#)
- [aaa group server](#)
- [radius-server host](#)

show debugging radius

Overview This command displays the current debugging status for the RADIUS servers.

Syntax show debugging radius

Mode User Exec and Privileged Exec

Example To display the current debugging status of RADIUS servers, use the command:

```
awplus# show debugging radius
```

Output The following shows typical output.

Example output from the show debugging radius command

```
RADIUS debugging status:  
RADIUS event debugging is off  
RADIUS packet debugging is off
```

show radius

Overview This command displays the current RADIUS server configuration and status.

Syntax show radius

Mode User Exec and Privileged Exec

Example To display the current status of RADIUS servers, use the command:
awplus# show radius

Output The following shows typical output.

Example output from the show radius command showing RADIUS servers

```
RADIUS Global Configuration
Source Interface : not configured
Secret Key : secret
Timeout : 5 sec
Retransmit Count : 3
Deadtime : 20 min
Server Host : 192.168.1.10
Authentication Port : 1812
Accounting Port : 1813
Secret Key : secret
Timeout : 3 sec
Retransmit Count : 2
Server Host : 192.168.1.11
Authentication Port : 1812
Accounting Port : not configured

Server Name/   Auth   Acct   Auth   Acct
IP Address    Port   Port   Status Status
-----
192.168.1.10  1812   1813   Alive  Alive
192.168.1.11  1812   N/A    Alive  N/A
```

Example See the sample output below showing RADIUS client status and RADIUS configuration:
awplus# show radius

Output The following shows typical output.

Example output from the show radius command showing RADIUS client status

```
RADIUS global interface name: awplus
Secret key:
Timeout: 5
Retransmit count: 3
Deadtime: 0

Server Address: 150.87.18.89
Auth destination port: 1812
Accounting port: 1813
Secret key: swg
Timeout: 5
Retransmit count: 3
Deadtime: 0
```

Output Parameter	Meaning
Source Interface	The interface name or IP address to be used for the source address of all outgoing RADIUS packets.
Secret Key	A shared secret key to a radius server.
Timeout	A time interval in seconds.
Retransmit Count	The number of retry count if a RADIUS server does not response.
Deadtime	A time interval in minutes to mark a RADIUS server as "dead".
Interim-Update	A time interval in minutes to send Interim-Update Accounting report.
Group Deadtime	The deadtime configured for RADIUS servers within a server group.
Server Host	The RADIUS server hostname or IP address.
Authentication Port	The destination UDP port for RADIUS authentication requests.
Accounting Port	The destination UDP port for RADIUS accounting requests.
Auth Status	The status of the authentication port. The status ("dead", "error", or "alive") of the RADIUS authentication server and, if dead, how long it has been dead for.
	Alive The server is alive.
	Error The server is not responding.

Output Parameter	Meaning
	Dead The server is detected as dead and it will not be used for deadtime period. The time displayed in the output shows the server is in dead status for that amount of time.
	Unknown The server is never used or the status is unknown.
Acct Status	The status of the accounting port. The status ("dead", "error", or "alive") of the RADIUS accounting server and, if dead, how long it has been dead for.

show radius dynamic-authorization counters

Overview Use this command to display the Dynamic Authorization message counters. It shows the count of sent and received messages, as well as a count of any error messages.

Syntax show radius dynamic-authorization counters

Mode Privileged Exec

Example To display the Dynamic Authorization message counters, use the following command:

```
awplus# show radius dynamic-authorization counters
```

Output The following shows typical output.

Example output from show radius dynamic-authorization counters

```
awplus#show radius dynamic-authorization counters

RADIUS Dynamic Authorization packet counters
-----
Received:
  Disconnect request      : 9
  CoA request             : 6

Sent:
  Disconnect ACK          : 4
  CoA ACK                 : 0
  Disconnect NAK          : 2
  CoA NAK                 : 6

Dropped:
  Duplicate packet        : 2
  Expired packet          : 1

Error-cause:
  Unsupported attribute    : 0
  Missing attribute        : 0
  Invalid request          : 0
  NAS ID mismatch          : 0
  No session context found : 3

Errors:
  Unknown message type     : 0
  Unknown client           : 0
  Bad attribute             : 0
  Bad authenticator        : 0
  Malformed packet         : 0
```

Related commands [radius dynamic-authorization-client](#)
[clear radius dynamic-authorization counters](#)

Command changes Version 5.5.1-1.1: command added

show radius local-server auth-mac-promiscuous

Overview Use this command to show the status of the **auth-mac-promiscuous** command.

Syntax show radius local-server auth-mac-promiscuous

Mode User Exec

Usage notes In promiscuous mode, the RADIUS server will respond with an Access-Accept for any Access-Request with a Radius Service-Type attribute of 'Call-Check', when the supplicants credentials are NOT in the user database.

If the credentials do appear in the database, the behavior of the server is unchanged.

Example To display the status of the **auth-mac-promiscuous** command, use the command:

```
awplus# show radius local-server auth-mac-promiscuous
```

Output The following shows typical output.

Example output from show radius local-server auth-mac-promiscuous

```
awplus#show radius local-server auth-mac-promiscuous
Auth-mac promiscuous mode: Disabled
...
```

Related commands [auth-mac-promiscuous](#)

Command changes Version 5.5.3-2.1: command added

show radius statistics

Overview This command shows the RADIUS client statistics for the device.

Syntax show radius statistics

Mode User Exec and Privileged Exec

Example See the sample output below showing RADIUS client statistics and RADIUS configuration:

```
awplus# show radius statistics
```

Output The following shows typical output.

Example output from the show radius statistics command:

```
RADIUS statistics for Server: 150.87.18.89
Access-Request Tx : 5 - Retransmit : 0
Access-Accept Rx : 1 - Access-Reject Rx : 2
Access-Challenge Rx : 2
Unknown Type : 0 - Bad Authenticator : 0
Malformed Access-Resp : 0 - Wrong Identifier : 0
Bad Attribute : 0 - Packet Dropped : 0
TimeOut : 0 - Dead count : 0
Pending Request : 0
```

undebug radius

Overview This command applies the functionality of the **no debug radius** .

47

Local RADIUS Server Commands

- Contents**
- **Introduction** on page 2430
 - **attribute (radsrv-grp)** on page 2431
 - **authentication** on page 2434
 - **client (radsecproxy-srv)** on page 2435
 - **client mutual-authentication** on page 2437
 - **client name-check** on page 2438
 - **client trustpoint** on page 2439
 - **clear radius local-server statistics** on page 2441
 - **copy fdb-radius-users (to file)** on page 2442
 - **copy local-radius-user-db (from file)** on page 2444
 - **copy local-radius-user-db (to file)** on page 2445
 - **crypto pki enroll local (deleted)** on page 2446
 - **crypto pki enroll local local-radius-all-users (deleted)** on page 2447
 - **crypto pki enroll local user (deleted)** on page 2448
 - **crypto pki export local pem (deleted)** on page 2449
 - **crypto pki export local pkcs12 (deleted)** on page 2450
 - **crypto pki trustpoint local (deleted)** on page 2451
 - **debug crypto pki (deleted)** on page 2452
 - **domain-style** on page 2453
 - **egress-vlan-id (radsrv-grp)** on page 2454
 - **egress-vlan-name (radsrv-grp)** on page 2456
 - **group (radsrv)** on page 2458
 - **help radius-attribute** on page 2459
 - **nas** on page 2461
 - **nas message-authenticator (radsrv)** on page 2463
 - **radius-secure-proxy local-server** on page 2465
 - **radius-server local** on page 2466
 - **server auth-port** on page 2467
 - **server enable** on page 2468
 - **server trustpoint (radsrv)** on page 2469
 - **show radius local-server group** on page 2471
 - **show radius local-server nas** on page 2472
 - **show radius local-server statistics** on page 2473
 - **show radius local-server trustpoint** on page 2475
 - **show radius local-server user** on page 2476
 - **user (radsrv)** on page 2478

- **vlan (radsrv-grp)** on page 2481

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure the local RADIUS server on the device. For more information, see the [Local RADIUS Server Feature Overview and Configuration Guide](#).

The local RADIUS server is not available in Secure Mode (see the [crypto secure-mode](#) command).

attribute (radsrv-grp)

Overview Use this command to define a RADIUS attribute for the local RADIUS server user group.

For a complete list of defined RADIUS attributes and values, see the [Local RADIUS Server Feature Overview and Configuration Guide](#).

When used with the **value** parameter the **attribute** command configures RADIUS attributes to the user group. If the specified attribute is already defined then it is replaced with the new value.

Use the **no** variant of this command to delete an attribute from the local RADIUS server user group.

Syntax attribute [repeated] {<attribute-name>|<attribute-id>} <value>
no attribute {<attribute-name>|<attribute-id>}

Parameter	Description
repeated	This optional parameter allows you to set multiple instances of the same attribute name or attribute ID.
<attribute-name>	RADIUS attribute name for standard attributes or Vendor- Specific attributes (see the Local RADIUS Server Feature Overview and Configuration Guide for tables of attributes).
<attribute-id>	RADIUS attribute numeric identifier for standard attributes.
<value>	RADIUS attribute value.

Default By default, no attributes are configured.

Mode Local RADIUS Server User Group Configuration

Usage notes For the Standard attributes, the attribute may be specified using either the attribute name, or its numeric identifier. For example, the command:

```
awplus(config-radsrv-group)# attribute acct-terminate-cause 1
```

will produce the same results as the command:

```
awplus(config-radsrv-group)# attribute 49 1
```

In the same way, where the specific attribute has a pre-defined value, the parameter *<value>* may be substituted with the Value Name or with its numeric value, for example the command:

```
awplus(config-radsrv-group)# attribute acct-terminate-cause  
user-request
```

will produce the same results as the command:

```
awplus(config-radsrv-group)# attribute 49 1
```

or the command:

```
awplus(config-radsrv-group)# attribute acct-terminate-cause 1
```

You can define more than one instance of an attribute name (or id) by using the **repeated** parameter. For example:

```
awplus(config-radsrv-group)# attribute repeated Nas-filter-Rule  
"deny in tcp from any to 0.0.0.0/0 23"
```

```
awplus(config-radsrv-group)# attribute repeated Nas-filter-Rule  
"deny in tcp from any to fe80::b1 23"
```

Examples To define the attribute name 'Service-Type' with Administrative User (6) to the RADIUS User Group 'Admin', use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group Admin
awplus(config-radsrv-group)# attribute Service-Type 6
```

To delete the attribute 'Service-Type' from the RADIUS User Group 'Admin', use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group Admin
awplus(config-radsrv-group)# no attribute Service-Type
```

To define multiple values for attribute 'NAS-Filter-Rule', use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group dynamicAcl
awplus(config-radsrv-group)# attribute repeated NAS-Filter-Rule
"deny in tcp from any to 0.0.0.0/0 23"
awplus(config-radsrv-group)# attribute repeated NAS-Filter-Rule
"deny in tcp from any to fe80::b1 23"
```

To delete a specific value from the attribute 'NAS-Filter-Rule', use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group dynamicAcl
awplus(config-radsrv-group)# no attribute NAS-Filter-Rule "deny
in tcp from any to 0.0.0.0/0 23"
```

Related commands [egress-vlan-id \(radsrv-grp\)](#)
[egress-vlan-name \(radsrv-grp\)](#)
[help radius-attribute](#)

Command changes Version 5.5.0-1.1: **repeated** parameter added

authentication

Overview Use this command to enable the specified authentication methods on the local RADIUS server.

Use the **no** variant of this command to disable specified authentication methods on the local RADIUS server.

Syntax authentication {mac|eapmd5|eaptls|peap}
no authentication {mac|eapmd5|eaptls|peap}

Parameter	Description
mac	Enable MAC authentication method.
eapmd5	Enable EAP-MD5 authentication method.
eaptls	Enable EAP-TLS authentication method.
peap	Enable EAP-PEAP authentication method.

Default All authentication methods are enabled by default.

Mode RADIUS Server Configuration

Examples The following commands enable EAP-MD5 authentication methods on the local RADIUS server.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# authentication eapmd5
```

The following commands disable EAP-MD5 authentication methods on Local RADIUS server.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no authentication eapmd5
```

Related commands [server enable](#)
[show radius local-server statistics](#)

client (radsecproxy-srv)

Overview Use this command to add a RadSec client (for example, a NAS device) to the RadSecProxy local-server application. The application will accept RADIUS requests from all configured clients.

Use the **no** variant of this command to delete a previously-configured client from the RadSecProxy local-server application.

Syntax `client {<hostname>|<ip-addr>} [name-check {on|off}]`
`no client {<hostname>|<ip-addr>}`

Parameter	Description
<	Hostname of client.
<ip-addr>	Specify the client IPv4 address, in dotted decimal notation (A.B.C.D).
n	Specify whether or not to enforce certificate name
c	checking for this client. If the parameter is not specified then the global behavior, which defaults to on , is used.
	Enable name checking for this client.
	Disable name checking for this client.

Mode RadSecProxy Local Server Configuration

Usage notes The client may be specified by its domain name or by its IPv4 address. If a domain name is used, it must be resolvable using a configured DNS name server.

Each client may be configured to use certificate name-checking; if not specified, the global behavior defined by **client name-check** or **no client name-check** will be used. If name checking is enabled, the Common Name portion of the subject field of the client's X.509 certificate must match the domain name or IP address specified in this command.

NOTE: *If mutual authentication is disabled then this parameter has no effect, see the command.*

Example To add a client called 'mynas.local' with certificate name checking **off**, use the commands:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy local-server
awplus(config-radsecproxy-srv)# client mynas.local name-check
off
```

Related commands [client mutual-authentication](#)
[client name-check](#)
[client trustpoint](#)
[radius-secure-proxy local-server](#)

client mutual-authentication

Overview This command enables or disables mutual certificate authentication for all RadSecProxy clients. When enabled, the RadSecProxy local-server application will request and validate an X.509 certificate from the client when establishing a connection.

The **no** variant of this command disables mutual certificate validation. The local-server application will still transmit the local server certificate to the client, but will not expect or validate a certificate from the client.

Syntax client mutual-authentication
no client mutual-authentication

Default Mutual authentication is enabled by default.

Mode RadSecProxy Local Server Configuration

Example Disable mutual certificate validation with the following command:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy local-server
awplus(config-radsecproxy-srv)# no client mutual-authentication
```

Related commands [client \(radsecproxy-srv\)](#)
[client name-check](#)
[radius-secure-proxy local-server](#)

Command changes Version 5.4.6-2.1: command added

client name-check

Overview This command sets the global behavior for certificate name-checking for the RadSecProxy localserver application to **on**. This behavior will be used for all clients associated with the application that do not specify a behavior on a per-client basis. If name-checking is enabled, the Common Name portion of the subject field of the client's X.509 certificate must match the domain name or IP address specified in the **client (radsecproxy-aaa)** command.

Use the **no** variant of this command to set the global behavior for certificate name checking to **off**

Syntax client name-check
no client name-check

Default Certificate name checking is on by default.

Mode RadSecProxy Local Server Configuration

Example Disable certificate name checking globally with the following command:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy local-server
awplus(config-radsecproxy-srv)# no client name-check
```

Related commands **client (radsecproxy-srv)**
client trustpoint
radius-secure-proxy local-server

client trustpoint

Overview This command adds one or more trustpoints to be used with the RadSecProxy local-server application. Multiple trustpoints may be specified, or the command may be executed more than once, to add multiple trustpoints to the application.

The **no** version of this command removes one or more trustpoints from the list of trustpoints associated with the application.

Syntax `client trustpoint [<trustpoint-list>]`
`no client trustpoint [<trustpoint-list>]`

Parameter	Description
<trustpoint-list>	Specify one or more trustpoints to be added or deleted.

Mode RadSecProxy Local Server Configuration

Usage notes The device certificate associated with the first trustpoint added to the application will be transmitted to remote servers. The certificate received from the remote server must have an issuer chain that terminates with the root CA certificate for any of the trustpoints that are associated with the application.

If you enter **client trustpoint** without specifying a trustpoint, the trustpoint list will be unchanged.

If you enter **no client trustpoint** without specifying a trustpoint, all trustpoints will be disassociated from the application.

Example You can add multiple trustpoints to the RadSecProxy local-server by executing the command multiple times:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy local-server
awplus(config-radsecproxy-srv)# client trustpoint example_1
awplus(config-radsecproxy-srv)# client trustpoint example_2
```

Alternatively, add multiple trustpoints with a single command:

```
awplus(config-radsecproxy-srv)# client trustpoint example_3
example_4
```

Disassociate all trustpoints from the RadSecProxy local-server application using the command:

```
awplus(config-radsecproxy-srv)# no client trustpoint
```

Related **client (radsecproxy-srv)**
commands **client name-check**
radius-secure-proxy local-server

clear radius local-server statistics

Overview Use this command to clear the statistics stored on the device for the local RADIUS server.

Use this command without any parameters to clear all types of local RADIUS server statistics.

Syntax clear radius local-server statistics [nas|server|user]

Parameter	Description
nas	Clear the NAS (Network Access Server) statistics on the device. For example, clearing statistics stored for NAS server invalid passwords.
server	Clear the Local RADIUS Server statistics on the device. For example, clearing Local RADIUS Servers statistics for all failed login attempts.
user	Clear the Local RADIUS Server user statistics. For example, clearing statistics stored for the number of successful user logins.

Mode Privileged Exec

Usage Refer to the sample output for the [show radius local-server statistics](#) for further information about the type of statistics each parameter option for this command clears. Both the **nas** and **server** parameters clear unknown username and invalid passwords statistics, while the user parameter clears the number of successful and failed logins for each local RADIUS server user.

Examples To clear the NAS (Network Access Server) statistics stored on the device, use the command:

```
awplus# clear radius local-server statistics nas
```

To clear the local RADIUS server statistics stored on the device, use the command:

```
awplus# clear radius local-server statistics server
```

To clear the local RADIUS server user statistics stored on the device, use the command:

```
awplus# clear radius local-server statistics user
```

Related commands [show radius local-server statistics](#)

copy fdb-radius-users (to file)

Overview Use this command to create a set of local RADIUS server users from MAC addresses in the local FDB. A local RADIUS server user created using this command can be used for MAC authentication.

Syntax `copy fdb-radius-users {local-radius-user-db|nvs|flash|usb|debug|tftp|scp|fserver|<url>} [interface <port>] [vlan <vid>] [group <name>] [export-vlan [<radius-group-name>]]`

Parameter	Description
local-radius-user-db	Copy the local RADIUS server users created to the local RADIUS server.
nvs	Copy the local RADIUS server users created to NVS memory.
flash	Copy the local RADIUS server users created to Flash memory.
usb	Copy the local RADIUS server users created to USB storage device.
debug	Copy the local RADIUS server users created to debug.
tftp	Copy the local RADIUS server users created to the TFTP destination.
scp	Copy the local RADIUS server users created to the SCP destination.
fserver	Copy the local RADIUS server users created to the remote file server.
<url>	Copy the local RADIUS server users created to the specified URL.
interface <port>	Copy only MAC addresses learned on a specified device port. Wildcards may be used when specifying an interface name.
vlan <vid>	Copy only MAC addresses learned on a specified VLAN.
group <name>	Assign a group name to the local RADIUS server users created.
export-vlan	Export VLAN ID assigned to exported FDB entry.
<radius-group-name>	Prefix for Radius group name storing VLAN ID

Mode Privileged Exec

Usage notes The local RADIUS server users created are written to a specified destination file in local RADIUS user CSV (Comma Separated Values) format. The local RADIUS server users can then be imported to a local RADIUS server using the **copy local-radius-user-db (from file)** command.

The name and password of the local RADIUS server users created use a MAC address, which can be used for MAC authentication.

This command does not copy a MAC address learned by the CPU or the management port.

This command can filter FDB entries by the interface name and the VLAN ID. When the interface name and the VLAN ID are specified, this command generates local RADIUS server users from only the MAC address learned on the specified interface and on the specified VLAN.

Examples To register the local RADIUS server users from the local FDB directly to the local RADIUS server, use the command:

```
awplus# copy fdb-radius-users local-radius-user-db
```

To register the local RADIUS server users from the interface port1.0.1 to the local RADIUS server, use the command:

```
awplus# copy fdb-radius-users local-radius-user-db interface  
port1.0.1
```

To copy output generated as local RADIUS server user data from MAC addresses learned on vlan10 on interface port1.0.1 to the file radius-user.csv, use the command:

```
awplus# copy fdb-radius-users radius-user.csv interface  
port1.0.1 vlan10
```

To copy output generated as local RADIUS server user data from MAC addresses learned on vlan10 on interface port1.0.1 to a file on the remote file server, use the command:

```
awplus# copy fdb-radius-users fserver interface port1.0.1 vlan10
```

Related commands **copy local-radius-user-db (to file)**
copy local-radius-user-db (from file)

copy local-radius-user-db (from file)

Overview Use this command to copy the Local RADIUS server user data from a file. The file, including the RADIUS user data in the file, must be in the CSV (Comma Separated Values) format.

You can select **add** or **replace** as the copy method. The **add** parameter option copies the contents of specified file to the local RADIUS server user database. If the same user exists then the old user is removed before adding a new user. The **replace** parameter option deletes all contents of the local RADIUS server user database before copying the contents of specified file.

Syntax `copy <source-url> local-radius-user-db [add|replace]`

Parameter	Description
<source-url>	URL of the source file.
add	Add file contents to local RADIUS server user database.
replace	Replace current local RADIUS server user database with file contents.

Default When no copy method is specified with this command the **replace** option is applied.

Mode Privileged Exec

Examples To replace the current local RADIUS server user data to the contents of `http://datahost/ user.csv`, use the following command:

```
awplus# copy http://datahost/user.csv local-radius-user-db
```

To add the contents of `http://datahost/user.csv` to the current local RADIUS server user database, use the following command:

```
awplus# copy http://datahost/user.csv local-radius-user-db add
```

Related commands [copy fdb-radius-users \(to file\)](#)
[copy local-radius-user-db \(to file\)](#)

copy local-radius-user-db (to file)

Overview Use this command to copy the local RADIUS server user data to a file. The output file produced is CSV (Comma Separated Values) format.

Syntax `copy local-radius-user-db {nvs|flash|usb|tftp|scp|<destination-url>}`

Parameter	Description
nvs	Copy to NVS memory.
flash	Copy to Flash memory.
usb	Copy to USB storage device.
tftp	Copy to TFTP destination.
scp	Copy to SCP destination.
<destination-url>	URL of the Destination file.

Mode Privileged Exec

Example Copy the current local RADIUS server user data to `http://datahost/user.csv`.

```
awplus# copy local-radius-user-db http://datahost/user.csv
```

Related commands [copy fdb-radius-users \(to file\)](#)
[copy local-radius-user-db \(from file\)](#)

crypto pki enroll local (deleted)

Overview This command is no longer available. Please use the following command instead:

crypto pki enroll *<trustpoint>*

Note that “local” is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

crypto pki enroll local local-radius-all-users (deleted)

Overview This command is no longer available. Please use the following command instead:

crypto pki enroll *<trustpoint>* local-radius-all-users

Note that “local” is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

crypto pki enroll local user (deleted)

Overview This command is no longer available. Please use the following command instead:

crypto pki enroll *<trustpoint>* user *<username>*

Note that “local” is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

crypto pki export local pem (deleted)

Overview This command is no longer available. Please use the **crypto pki export pem** command instead:

```
crypto pki export <trustpoint> pem [terminal|<url>]
```

Note that "local" is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

crypto pki export local pkcs12 (deleted)

Overview This command is no longer available. Please use the **crypto pki export pkcs12** command instead:

```
crypto pki export <trustpoint> pkcs12 {ca|server|<username>}  
<url>
```

Note that “local” is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

crypto pki trustpoint local (deleted)

Overview This command is no longer available. Please use the following command instead:

crypto pki trustpoint *<trustpoint>*

Note that “local” is a valid name for a trustpoint, so you do not need to modify existing configurations or scripts.

debug crypto pki (deleted)

Overview This command is no longer available.

domain-style

Overview Use this command to enable a specified domain style on the local RADIUS server. The local RADIUS server decodes the domain portion of a username login string when this command is enabled.

Use the **no** variant of this command to disable the specified domain style on the local RADIUS server.

Syntax domain-style {suffix-atsign|ntdomain}
no domain-style {suffix-atsign|ntdomain}

Parameter	Description
suffix-atsign	Enable at sign "@" delimited suffix style, i.e. "user@domain".
ntdomain	Enable NT domain style, i.e. "domain\user".

Default This feature is disabled by default.

Mode RADIUS Server Configuration

Usage notes When both domain styles are enabled, the first domain style configured has the highest priority. A username login string is matched against the first domain style enabled. Then, if the username login string is not decoded, it is matched against the second domain style enabled.

Examples To enable NT domain style on the local RADIUS server, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# domain-style ntdomain
```

To disable NT domain style on the local RADIUS server, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no domain-style ntdomain
```

Related commands [server enable](#)

egress-vlan-id (radsrv-grp)

Overview Use this command to configure the standard RADIUS attribute 'Egress-VLANID (56)' for the local RADIUS Server user group.

Use the **no** variant of this command to remove the Egress-VLANID attribute from the local RADIUS server user group.

Syntax egress-vlan-id <vid> [tagged|untagged]
no egress-vlan-id

Parameter	Description
<vid>	The VLAN identifier to be used for the Egress VLANID attribute, in the range 1 to 4094.
tagged	Set frames on the VLAN as tagged. This sets the tag indication field to indicate that all frames on this VLAN are tagged.
untagged	Set all frames on the VLAN as untagged. This sets the tag indication field to indicate that all frames on this VLAN are untagged.

Default By default, no Egress-VLANID attributes are configured.

Mode Local RADIUS Server User Group Configuration

Usage When a Voice VLAN is configured for dynamic VLAN allocation (**switchport voice vlan**), the RADIUS server must be configured to send the VLAN information when an IP phone is successfully authenticated. Use either the **egress-vlan-id (radsrv-grp)** command or the **egress-vlan-name (radsrv-grp)**, and specify the **tagged** parameter.

Examples To set the 'Egress-VLANID' attribute for the 'NormalUsers' local RADIUS server user group to VLAN identifier 200, with tagged frames, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# egress-vlan-id 200 tagged
```

To remove the 'Egress-VLANID' attribute for the 'NormalUsers' local RADIUS server user group, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# no egress-vlan-id
```

Related commands [attribute \(radsrv-grp\)](#)
[egress-vlan-name \(radsrv-grp\)](#)
[switchport voice vlan](#)

egress-vlan-name (radsrv-grp)

Overview Use this command to configure the standard RADIUS attribute 'Egress-VLAN-Name (58)' for the local RADIUS server user group.

Use the **no** variant of this command to remove the Egress-VLAN-Name attribute from the local RADIUS server user group.

Syntax egress-vlan-name <vlan-name> [tagged|untagged]
no egress-vlan-name

Parameter	Description
<vlan-name>	The VLAN name to be configured as the Egress-VLAN-Name attribute.
tagged	Set frames on the VLAN as tagged. This sets the tag indication field to indicate that all frames on this VLAN are tagged.
untagged	Set all frames on the VLAN as untagged. This sets the tag indication field to indicate that all frames on this VLAN are untagged.

Default By default, no Egress-VLAN-Name attributes are configured.

Mode Local RADIUS Server User Group Configuration

Usage When a Voice VLAN is configured for dynamic VLAN allocation (**switchport voice vlan**), the RADIUS server must be configured to send the VLAN information when an IP phone is successfully authenticated. Use either the **egress-vlan-id (radsrv-grp)** or the **egress-vlan-name (radsrv-grp)** command, and specify the **tagged** parameter.

Examples To configure the 'Egress-VLAN-Name' attribute for the RADIUS server user group 'NormalUsers' with the VLAN name vlan2 and all frames on this VLAN tagged, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# egress-vlan-name vlan2 tagged
```

To delete the 'Egress-VLAN-Name' attribute for the 'NormalUsers' group, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# no egress-vlan-name
```

Related commands [attribute \(radsrv-grp\)](#)
[egress-vlan-id \(radsrv-grp\)](#)
[switchport voice vlan](#)

group (radsrv)

Overview Use this command to create a local RADIUS server user group, and enter local RADIUS Server User Group Configuration mode.

Use the **no** variant of this command to delete the local RADIUS server user group.

Syntax group <user-group-name>
no group <user-group-name>

Parameter	Description
<user-group-name>	User group name string.

Mode RADIUS Server Configuration

Examples The following command creates the user group NormalUsers.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
```

The following command deletes the user group NormalUsers.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no group NormalUsers
```

Related commands [user \(radsrv\)](#)
[show radius local-server user](#)
[vlan \(radsrv-grp\)](#)

help radius-attribute

Overview Use this command to display a list of standard and vendor specific valid RADIUS attributes that are supported by the local RADIUS server.

Syntax help radius-attribute [<attribute-name>|<attribute-ID>]

Parameter	Description
<attribute-name>	List the details and predefined values for the named attribute.
<attribute-ID>	List the details and predefined values for the given attribute ID.

Mode Privileged Exec

Usage notes When used without a parameter, this command lists all of the available RADIUS attributes.

When used with an attribute name or ID, this command displays the attribute name, value type, and any predefined values.

Example To list all available RADIUS attributes, use the following command:

```
awplus# help radius-attribute
```

```
awplus#help radius-attribute
Standard Attributes:
 1      User-Name
 2      User-Password
 3      CHAP-Password
 4      NAS-IP-Address
 5      NAS-Port
 6      Service-Type
...
```

To display the details for the RADIUS attribute Frag-Status, use the following command:

```
awplus# help radius-attribute frag-status
```

```
awplus#help radius-attribute frag-status
Frag-Status : integer (Integer number)

Pre-defined values :
  Fragmentation-Supported (1)
  More-Data-Pending (2)
  More-Data-Request (3)
  Reserved (0)
```

Related commands [attribute \(radsrv-grp\)](#)

Command Version 5.4.8-0.2: command added
changes Version 5.4.9-0.1: added to x530 Series products

nas

Overview This command adds a client device (the Network Access Server or the NAS) to the list of devices that are able to send authentication requests to the local RADIUS server. The NAS is identified by its IP address and a shared secret (also referred to as a shared key) must be defined that the NAS will use to establish its identity.

Use the **no** variant of this command to remove a NAS client from the list of devices that are allowed to send authentication requests to the local RADIUS server.

Syntax `nas <ip-address> key <nas-keystring> [encrypted]`
`no nas <ip-address>`

Parameter	Description
<ip-address>	RADIUS NAS IP address.
<nas-keystring>	NAS shared keystring.
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.

Mode RADIUS Server Configuration

Examples The following commands add the NAS with an IP address of 192.168.1.2 to the list of clients that may send authentication requests to the local RADIUS server. Note the shared key that this NAS will use to establish its identity is NAS_PASSWORD.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# nas 192.168.1.2 key NAS_PASSWORD
```

The following commands remove the NAS with an IP address of 192.168.1.2 from the list of clients that are allowed to send authentication requests to the local RADIUS server:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no nas 192.168.1.2
```

Related commands [nas message-authenticator \(radsrv\)](#)
[show radius local-server nas](#)

Command changes Version 5.5.3-2.1: **encrypted** parameter added

nas message-authenticator (radsvr)

Overview Use this command to decide whether or not to require verification of RADIUS packets for a specific NAS. Verification prevents RADIUS protocol forgery attacks. It is achieved by putting a Message-Authenticator attribute in Access-Requests from the NAS.

Use the **no** variant of this command to return the setting to the default.

Syntax nas <ip-address> message-authenticator {required|optional|auto}
no nas <ip-address> message-authenticator

Parameter	Description
<ip-address>	The IP address of the NAS.
required	Discard Access-Requests that have no Message-Authenticator attribute, or that have an invalid Message-Authenticator attribute.
optional	Allow Access-Requests that have no Message-Authenticator attribute, and discard Access-Requests that have an invalid Message-Authenticator attribute.
auto	Determine the mode based on the content of the first Access-Request received. On the basis of this, the device will produce a log message to tell you which mode you should configure. Only use auto temporarily while you are transitioning an existing network or adding new NAS devices with unknown support for Message-Authenticator.

Default auto

Mode RADIUS Server Configuration

Usage notes If you use both MAC authentication and web authentication to authenticate the same TQ Series access point, make sure you set this to **optional**. Otherwise, web authentication may fail.

This is because if the first packet that the server receives from the client contains a valid Message-Authenticator attribute, then by default all subsequent packets from that client must also contain the same Message-Authenticator attribute. If packets don't contain the attribute, the server drops them. This can cause an issue on TQ series APs, because on these APs, MAC authentication's initial packet contains the attribute, and web authentication's initial packet doesn't. This means that web authentication will fail if MAC authentication has already happened.

Setting this to **optional** allows the server to accept packets from a client when the packets don't have a Message-Authenticator attribute, even if the server has already received a packet from that client that contained a Message-Authenticator attribute. This means both web authentication and MAC authentication will succeed, no matter which happens first.

Examples To require Message-Authenticator attributes in messages from a registered NAS whose IP address is 192.168.1.2, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsvr)# nas 192.168.1.2 message-authenticator
required
```

To make Message-Authenticator attributes optional in messages from a registered NAS whose IP address is 192.168.1.9, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsvr)# nas 192.168.1.9 message-authenticator
optional
```

To return to the default behavior of **auto** for the NAS whose IP address is 192.168.1.9, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsvr)# no nas 192.168.1.9 message-authenticator
```

Related commands [ip radius require-message-authenticator nas](#)
[show radius local-server nas](#)

Command changes Version 5.5.4-2.3: command added

radius-secure-proxy local-server

Overview Use this command to enter the RadSecProxy local-server application configuration mode. This application allows remote RadSec clients to communicate with the local RADIUS server process via a secure (TLS) proxy.

Syntax radius-secure-proxy local-server

Mode Global Configuration Mode

Example To change mode from User Exec mode to the RadSecProxy local-server configuration mode, use the commands:

```
awplus# configure terminal
awplus(config)# radius-secure-proxy local-server
awplus(config-radsecproxy-srv)#
```

Related commands

- client (radsecproxy-srv)**
- client name-check**
- client trustpoint**

radius-server local

Overview Use this command to navigate to the Local RADIUS server configuration mode (`config-radsrv`) from the Global Configuration mode (`config`).

Syntax `radius-server local`

Mode Global Configuration

Example Local RADIUS Server commands are available from `config-radsrv` configuration mode. To change mode from User Exec mode to the Local RADIUS Server mode (`config-radsrv`), use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)#
```

Output

```
awplus(config)#radius-server local
Creating Local CA repository.....OK
Enrolling Local System to local trustpoint..OK
awplus(config-radsrv)#
```

Related commands

- [server enable](#)
- [show radius local-server group](#)
- [show radius local-server nas](#)
- [show radius local-server statistics](#)
- [show radius local-server user](#)

server auth-port

Overview Use this command to change the UDP port number for local RADIUS server authentication.

Use the **no** variant of this command to reset the RADIUS server authentication port back to the default.

Syntax server auth-port <1-65535>
no server auth-port

Parameter	Description
<1-65535>	UDP port number.

Default The default local RADIUS server UDP authentication port number is 1812.

Mode RADIUS Server Configuration

Examples The following commands set the RADIUS server authentication port to 10000.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# server auth-port 10000
```

The following commands reset the RADIUS server authentication port back to the default UDP port of 1812.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no server auth-port
```

Related commands [server enable](#)
[show radius local-server statistics](#)

server enable

Overview This command enables the local RADIUS server. The local RADIUS server feature is started immediately when this command is issued.

The **no** variant of this command disables local RADIUS server. When this command is issued, the local RADIUS server stops operating.

Syntax server enable
no server enable

Default The local RADIUS server is disabled by default and must be enabled for use with this command.

Mode RADIUS Server Configuration

Examples To enable the local RADIUS server, use the following commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# server enable
```

To disable the local RADIUS server, use the command:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no server enable
```

Related commands [server auth-port](#)
[show radius local-server statistics](#)

server trustpoint (radsrv)

Overview Use this command to add one or more trustpoints to the local RADIUS server. You can specify multiple trustpoints on one line, or execute the command more than once to add multiple trustpoints to the local RADIUS server.

Use the **no** variant to remove one or more trustpoints from the local RADIUS server.

Syntax `server trustpoint [<trustpoint-list>]`
`no server trustpoint [<trustpoint-list>]`

Parameter	Description
<trustpoint-list>	Specify one or more trustpoints to be added or deleted

Default By default, the local trustpoint is associated with the local RADIUS server.

Mode RADIUS Server Configuration

Usage Notes If you do not specify any trustpoints, the command displays a list of trustpoints but leaves the list unchanged.

If you use the **no server trustpoint** command without specifying any trustpoints, then all trustpoints will be removed from the local RADIUS server.

Example To configure a trustpoint called 'my_trustpoint' on the local RADIUS server, use the commands:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# server trustpoint my_trustpoint
```

You can add multiple trustpoints to the local RADIUS server by executing the **server trustpoint** command multiple times:

```
awplus(config-radsrv)# server trustpoint my_trustpoint1
my_trustpoint2
```

To remove the trustpoint called 'my_trustpoint' from the local RADIUS server, use the command:

```
awplus(config-radsrv)# no server trustpoint my_trustpoint
```

To remove all trustpoints from the local RADIUS server, use the command:

```
awplus(config-radsrv)# no server trustpoint
```

Related commands **show radius local-server trustpoint**
server enable
client trustpoint
server trustpoint

Command changes Version 5.4.1-1.1: command added.

show radius local-server group

Overview Use this command to display information about the local RADIUS server user group.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show radius local-server group [*<user-group-name>*]

Parameter	Description
<i><user-group-name></i>	User group name string.

Mode User Exec and Privileged Exec

Example The following command displays Local RADIUS server user group information.

```
awplus# show radius local-server group
```

Output The following shows typical output.

Example output from the show radius local-server group command

Group-Name	Vlan
-----	-----
NetworkOperators	ManagementNet
NormalUsers	CommonNet

Parameters in the output of the show radius local-server group command

Parameter	Description
Group-Name	Group name.
Vlan	VLAN name assigned to the group.

Related commands [group \(radsrv\)](#)

show radius local-server nas

Overview Use this command to display information about NAS (Network Access Servers) registered to the local RADIUS server.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show radius local-server nas [*<ip-address>*]

Parameter	Description
<i><ip-address></i>	Specify NAS IP address for show output.

Mode User Exec and Privileged Exec

Example The following command displays NAS information.

```
awplus# show radius local-server nas
```

Output The following shows typical output.

Example output from the show radius local-server nas command

NAS-Address	Shared-Key (encrypted)	Message Authenticator
127.0.0.1	dbSQ8ED....	optional

Parameters in the output of the show radius local-server nas command

Parameter	Description
NAS-Address	IP address of NAS.
Shared-Key	Shared key used for RADIUS connection.
Message Authenticator	The message-authenticator mode.

Related commands [nas](#)
[nas message-authenticator \(radsvr\)](#)

show radius local-server statistics

Overview Use this command to display statistics about the local RADIUS server.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show radius local-server statistics

Mode User Exec and Privileged Exec

Usage notes Both unknown usernames and invalid passwords will display as failed logins in the show output.

Example The following command displays local RADIUS server statistics.

```
awplus# show radius local-server statistics
```

Output The following shows typical output.

Example output from the show radius local-server statistics command

```
awplus# show radius local-server statistics
Server status      : Run (administrative status is enable)
Enabled methods    : MAC EAP-MD5 EAP-TLS EAP-PEAP
Available methods  : MAC EAP-MD5 EAP-TLS EAP-PEAP
EAP trustpoints    : local
Promiscuous mode   : Enabled
Successes          :7                               Unknown NAS           :0
Failed Logins      :0                               Invalid packet from NAS:0
Internal Error     :0                               Unknown Error          :0

NAS : 127.0.0.1
Successes          :7                               Shared key mismatch    :0
Failed Logins      :0                               Unknown RADIUS message :0
Unknown EAP message :0                               Unknown EAP auth type  :0
Corrupted packet   :0

Users present in the User Database:
Username                               Successes  Failures  LastInteraction
                                         Local time (+00:00)
00-00-00-00-00-01                       0          0         -
00-00-00-00-00-02                       0          0         -
00-15-65-3f-d9-42                       0          0         -
00-90-0b-45-07-e4                       4          0         09 Jan
2024 00:32:24
tester1                                 2          0         09 Jan
2024 00:31:52
tester2                                 0          0         -
user1                                   0          0         -
user1dynvlan                           0          0         -
user2dynvlan                           0          0         -

Users NOT present in the User Database:
Username                               Successes  Failures  Last Interaction
                                         Local time (+00:00)
00-90-0b-45-07-e2                       1          0         09 Jan 2024 00:31:50
```

Related commands **clear radius local-server statistics**
radius-server local
server enable
server auth-port

show radius local-server trustpoint

Overview Displays the PKI trustpoints associated with the local RADIUS server.

Syntax show radius local-server trustpoint

Mode User Exec

Example To show the local RADIUS server trustpoint(s), use the commands:

```
awplus# show radius local-server trustpoint
```

Output The following shows typical output.

Example output from show radius local-server trustpoint

```
show radius local-server trustpoint
Current PKI trustpoints for RADIUS EAP-TLS:
my_trustpoint
```

Related commands

- [server trustpoint \(radsrv\)](#)
- [radius-server local](#)
- [server enable](#)
- [show radius local-server statistics](#)

Command changes Version 5.4.6-1.1: command added

show radius local-server user

Overview Use this command to display information about the local RADIUS server user.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show radius local-server user [*<user-name>*]
show radius local-server user [*<user-name>*] format csv
show radius local-server user [*<user-name>*] detail

Parameter	Description
<i><user-name></i>	RADIUS user name. If no user name is specified, information for all users is displayed.
format csv	Format output as CSV. This parameter is only available in Privileged Exec mode.
detail	Display detailed information about the user.

Mode User Exec and Privileged Exec

Examples The following command displays Local RADIUS server user information for user Tom.

```
awplus# show radius local-server user Tom
```

Example output from the show radius local-server user command

User-Name	Group	Vlan
-----	-----	-----
Tom	NetworkOperators	ManagementNet

The following command displays all Local RADIUS server information for all users.

```
awplus# show radius local-server user
```

The following command displays Local RADIUS server user information for Tom in CSV format (only available in Privileged Exec mode).

```
awplus# show radius local-server user Tom format csv
```

Example output from the show radius local-server user Tom format csv command

```
true,"NetworkOperators","Tom","abcd",0,2099/01/01,1,"","","ManagementNet"false,3600,false,0,"",false
```

The following command displays detailed Local RADIUS server user information for all users.

```
awplus# show radius local-server user detail
```

Example output from the show radius local-server user detail command

```
awplus# show radius local-server user detail
Total users: 1
Maximum users allowed by license: 3
-----
Username   : Tom
Group      : NetworkOperators
Vlan       : VlanName
```

Parameters in the output from the show radius local-server user command

Parameter	Description
User - Name	User name.
Group	Group name assigned to the user.
Vlan	VLAN name assigned to the user.

Related commands [group \(radsrv\)](#)
[user \(radsrv\)](#)

Command changes Version 5.4.9-0.1: **detail** parameter added

user (radsrv)

Overview Use this command to register a user to the local RADIUS server.

Use the **no** variant of this command to delete a user from the local RADIUS server.

Syntax user <radius-user-name> [encrypted] password <user-password>
[group <user-group>]
no user <radius-user-name>

Parameter	Description
<radius-user-name>	RADIUS user name. See the Usage Notes for details. This can also be a MAC address in the IEEE standard format of HH-HH-HH-HH-HH-HH if you are configuring MAC authentication to use local RADIUS server.
encrypted	Specifies that the password is being entered in its encrypted form, so that it is not further encrypted. When creating a new user, enter the password in plaintext, and do not use the encrypted parameter. Use the encrypted parameter only when referring to a user that has previously been created. For instance, when adding an existing user from another RADIUS server, use the encrypted parameter, and enter the encrypted version of the password that appears in the output of show commands for the user.
<user-password>	User password. This can also be a MAC address in the IEEE standard format of HH-HH-HH-HH-HH-HH if you are configuring MAC authentication to use local RADIUS server.
group	Specify the group for the user.
<user-group>	User group name.

Mode RADIUS Server Configuration

Usage notes The user name can contain alphanumeric ASCII characters, plus signs (ASCII 43), dashes (ASCII 45), dots (ASCII 46), @ signs (ASCII 64), slashes (ASCII 47), backslashes (ASCII 92), and underscores (ASCII 95). It cannot contain spaces. It must not start with a digit, a plus sign, a dash or an @ sign. It must not end with an @ sign. On the AlliedWare Plus CLI, it is case sensitive.

It cannot contain question marks (?), spaces (), or double quote characters.

RADIUS user names containing the following characters cannot use certificate authentication:

/ \ \$ & () * ; < > |

Certificates cannot be created and exported for RADIUS user names that contain the above characters. We advise you to avoid using these characters in RADIUS user names if you need to use certificate authentication, because you will not be able to create and export certificates.

You also can use the IEEE standard format hexadecimal notation (HH-HH-HH-HH-HH-HH) to specify a supplicant MAC address to configure the user name and user password parameters to use local RADIUS server for MAC Authentication. See the [AAA and Port_Authentication Feature Overview and Configuration_Guide](#) for a sample MAC configuration. See also the command **user 00-db-59-ab-70-37 password 00-db-59-ab-70-37** as shown in the command examples.

Examples The following commands add user 'Tom' to the local RADIUS server and sets his password to 'QwerSD'.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# user Tom password QwerSD
```

The following commands add user 'Tom' to the local RADIUS server user group 'NormalUsers' and sets his password 'QwerSD'.

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# user Tom password QwerSD group
NormalUsers
```

The following commands remove user 'Tom' from the local RADIUS server:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no user Tom
```

The following commands add the supplicant MAC address 00-d0-59-ab-70-37 to the local RADIUS server:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# user 00-db-59-ab-70-37 password 00-db-59-
ab-70-37
```

The following commands remove the supplicant MAC address 00-d0-59-ab-70-37 from the local RADIUS server:

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# no user 00-db-59-ab-70-37
```

Related commands [group \(radsrv\)](#)
[show radius local-server user](#)

vlan (radsrv-grp)

Overview Use this command to set the VLAN ID or name for the local RADIUS server user group. The VLAN information is used for authentication with the dynamic VLAN feature.

Use the **no** variant of this command to clear the VLAN ID or VLAN name for the local RADIUS server user group.

Syntax `vlan {<vid>|<vlan-name>}`
`no vlan`

Parameter	Description
<vid>	VLAN ID.
<vlan-name>	VLAN name.

Default VLAN information is not set by default.

Mode Local RADIUS Server User Group Configuration

Examples The following commands set VLAN ID 200 to the group named 'NormalUsers':

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# vlan 200
```

The following commands remove VLAN ID 200 from the group named 'NormalUsers':

```
awplus# configure terminal
awplus(config)# radius-server local
awplus(config-radsrv)# group NormalUsers
awplus(config-radsrv-group)# no vlan
```

Related commands [group \(radsrv\)](#)
[show radius local-server user](#)

48 Public Key Infrastructure and Crypto Commands

- Contents**
- **Introduction** on page 2483
 - **crypto key generate rsa** on page 2484
 - **crypto key zeroize** on page 2485
 - **crypto pki authenticate** on page 2486
 - **crypto pki enroll** on page 2487
 - **crypto pki enroll user** on page 2488
 - **crypto pki export pem** on page 2490
 - **crypto pki export pkcs12** on page 2491
 - **crypto pki import pem** on page 2493
 - **crypto pki import pkcs12** on page 2495
 - **crypto pki trustpoint** on page 2497
 - **crypto secure-mode** on page 2499
 - **crypto secure-mode delete hostkey** on page 2500
 - **crypto verify** on page 2501
 - **crypto verify bootrom** on page 2503
 - **crypto verify signed** on page 2505
 - **enrollment (ca-trustpoint)** on page 2507
 - **fingerprint (ca-trustpoint)** on page 2509
 - **lifetime** on page 2511
 - **no crypto pki certificate** on page 2512
 - **rsakeypair (ca-trustpoint)** on page 2513
 - **show crypto key mypubkey rsa** on page 2515
 - **show crypto pki certificates** on page 2516
 - **show crypto pki enrollment user** on page 2518
 - **show crypto pki trustpoint** on page 2519
 - **show hash** on page 2521
 - **show secure-mode** on page 2522
 - **subject-name (ca-trustpoint)** on page 2523

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure the Public Key Infrastructure (PKI) capabilities on an AlliedWare Plus device. For more information about PKI, see the [Public Key Infrastructure \(PKI\) Feature Overview and Configuration Guide](#).

crypto key generate rsa

Overview Use this command to generate a cryptographic public/private key pair for the Rivest-Shamir-Adleman (RSA) encryption algorithm.

Syntax `crypto key generate rsa [label <keylabel>] [<1024-16384>]`

Parameter	Description
label	Specify and optional label for the key.
<keylabel>	The name of the key to be created. The name must start with an alphanumeric character, and may only contain alphanumeric characters, underscores, dashes, or periods. The maximum length of the name is 63 characters. If no label is specified the default value "server-default" is used.
<1024-16384>	The bit length for the key. If no bit length is specified the default of 2048 is used.

Mode Privileged Exec

Usage notes The generated key may be used for multiple server certificates in the system. A key is referenced by its label. A bit length between 1024 and 16384 bits may be specified. Larger bit lengths are more secure, but require more computation time.

The specified key must not already exist.

Example To create a key with the label 'example-server-key' and a bit length of 4096, use the commands:

```
awplus> enable
awplus# crypto key generate rsa label example-server-key 4096
```

Related commands [crypto key zeroize](#)

[rsakeypair \(ca-trustpoint\)](#)

[show crypto key mypubkey rsa](#)

Command changes Version 5.5.2-2.1: Key length increased to 16384

crypto key zeroize

Overview Use this command to delete one or all cryptographic public/private key pairs.

Syntax `crypto key zeroize rsa <keylabel>`
`crypto key zeroize all`

Parameter	Description
<code>rsa</code>	Delete a single key pair for the Rivest-Shamir-Adleman (RSA) encryption algorithm.
<code>all</code>	Delete all keys.

Mode Privileged Exec

Usage notes

When the system is in secure mode, this command will securely delete the file (the file's sectors in NVS will be overwritten with random data three times before deletion). When the device is not in secure mode, this command has the same effect as using the **delete** command (it deletes the file from Flash memory but does not overwrite it with zeros).

The specified key must exist but must not be in use for any existing server certificates.

A key may not be deleted if it is associated with the server certificate or server certificate signing request for an existing trustpoint. To remove a server certificate so that the key may be deleted, use the **no crypto pki enroll** command to de-enroll the server.

Example To delete an RSA key named "example-server-key", use the following command:

```
awplus# crypto key zeroize rsa example-server-key
```

Related commands [crypto key generate rsa](#)
[show crypto key mypubkey rsa](#)
[crypto secure-mode](#)

Command changes Version 5.4.6-1.1: zeroize functionality added to x930 Series
Version 5.4.8-1.2: zeroize functionality added to x220, XS900MX, x550 Series
Version 5.4.8-2.1: zeroize functionality added to SBx908 GEN2, x950 Series

crypto pki authenticate

Overview Use this command to authenticate a trustpoint by generating or importing the root CA certificate. This must be done before the server can be enrolled to the trustpoint.

Syntax `crypto pki authenticate <trustpoint>`

Parameter	Description
<trustpoint>	The name of the trustpoint to be authenticated.

Mode Privileged Exec

Usage notes If the trustpoint's **enrollment** setting is "selfsigned", then this command causes a private key to be generated for the root CA, and a self-signed certificate to be generated based on that key.

If the trustpoint's **enrollment** setting is "terminal", then this command prompts the user to paste a certificate Privacy Enhanced Mail (PEM) file at the CLI terminal. If the certificate is a valid selfsigned CA certificate, then it will be stored as the trustpoint's root CA certificate.

The specified trustpoint must already exist, and its enrollment mode must have been defined.

Example To show the **enrollment** setting of a trustpoint named "example" and then generate a certificate from it, use the commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# enrollment selfsigned
awplus(config)# exit
awplus# exit
awplus# crypto pki authenticate example
```

Related commands [crypto pki import pem](#)
[crypto pki trustpoint](#)
[enrollment \(ca-trustpoint\)](#)

crypto pki enroll

Overview Use this command to enroll the local server to the specified trustpoint.
Use the **no** variant of this command to de-enroll the server by removing its certificate

Syntax `crypto pki enroll <trustpoint>`
`no crypto pki enroll <trustpoint>`

Parameter	Description
<code><trustpoint></code>	The name of the trustpoint to be enrolled

Mode Privileged Exec

Usage notes For the local server, “enrollment” is the process of creating of a certificate for the server that has been signed by a CA associated with the trustpoint. The public portion of the RSA key pair specified using the `rsakeypair` parameter for the trustpoint will be included in the server certificate.

If the trustpoint represents a locally self-signed certificate authority, then this command results in the direct generation of the server certificate, signed by the root CA for the trustpoint.

If the trustpoint represents an external certificate authority, then this command results in the generation of a Certificate Signing Request (CSR) file, which is displayed at the terminal in Privacy-Enhanced Mail (PEM) format, suitable for copying and pasting into a file or message. The CSR must be sent to the external CA for processing. When the CA replies with the signed certificate, that certificate should be imported using the `crypto pki import pem` command, to complete the enrollment process.

The specified trustpoint must already exist, and it must already be authenticated.

Example To enroll the local server with the trustpoint “example”, use the following commands:

```
awplus> enable
awplus# crypto pki enroll example
```

Related commands [crypto pki enroll user](#)
[crypto pki import pem](#)
[crypto pki trustpoint](#)
[enrollment \(ca-trustpoint\)](#)

crypto pki enroll user

Overview Use this command to enroll a single RADIUS user or all RADIUS users to the specified trustpoint.

Use the **no** variant of this command to remove the PKCS#12 file from the system. Note that the PKCS#12 files are generated in a temporary (volatile) file system, so a system restart also results in removal of all of the files.

Syntax `crypto pki enroll <trustpoint>
{user <username>|local-radius-all-users}
no crypto pki enroll <trustpoint>
{user <username>|local-radius-all-users}`

Parameter	Description
<trustpoint>	The name of the trustpoint to which users are to be enrolled.
<username>	The name of the user to enroll to the trustpoint.

Mode Privileged Exec

Usage notes For RADIUS users, “enrollment” is the process of generating a private key and a corresponding client certificate for each user, with the certificate signed by the root CA for the trustpoint. The resulting certificates may be exported to client devices, for use with PEAP or EAP-TLS authentication with the local RADIUS server.

The specified trustpoint must represent a locally self-signed certificate authority.

The private key and certificate are packaged into a PKCS#12-formatted file, suitable for export using the **crypto pki export pkcs12** command. The private key is encrypted for security, with a passphrase that is entered at the command line. The passphrase is required when the PKCS#12 file is imported on the client system. The passphrase is not stored anywhere on the device, so users are responsible for remembering it until the export-import process is complete.

If **local-radius-all-users** is specified instead of an individual user, then keys and certificates for all RADIUS users will be generated at once. All the keys will be encrypted using the same passphrase.

The specified trustpoint must already exist, it must represent a locally self-signed CA, and it must already have been authenticated.

Example To enroll the user “example-user” with the trustpoint “example”, use the following commands:

```
awplus> enable
```

```
awplus# crypto pki enroll example user example-user
```

To enroll all local RADIUS users with the trustpoint “example”, use the following commands:

```
awplus> enable
```

```
awplus# crypto pki enroll example local-radius-all-users
```

Related commands [crypto pki export pkcs12](#)
[crypto pki trustpoint](#)

crypto pki export pem

Overview Use this command to export the root CA certificate for the given trustpoint to a file in Privacy-Enhanced Mail (PEM) format. The file may be transferred to the specified destination URL, or displayed at the terminal.

Syntax `crypto pki export <trustpoint> pem [terminal|<url>]`

Parameter	Description
<trustpoint>	The name of the trustpoint for which the root CA certificate is to be exported.
terminal	Display the PEM file to the terminal.
<url>	Transfer the PEM file to the specified URL.

Default The PEM will be displayed to the terminal by default.

Mode Privileged Exec

Usage notes The specified trustpoint must already exist, and it must already be authenticated.

Example To display the PEM file for the trustpoint "example" to the terminal, use the following commands:

```
awplus> enable
```

```
awplus# crypto pki export example pem terminal
```

To export the PEM file "example.pem" for the trustpoint "example" to the URL "tftp://server_a/", use the following commands:

```
awplus> enable
```

```
awplus# crypto pki export example pem tftp://server_a/  
example.pem
```

Related commands

- [crypto pki authenticate](#)
- [crypto pki import pem](#)
- [crypto pki trustpoint](#)

crypto pki export pkcs12

Overview Use this command to export a certificate and private key for an entity in a trustpoint to a file in PKCS#12 format at the specified URL. The private key is encrypted with a passphrase for security.

Syntax `crypto pki export <trustpoint> pkcs12 {ca|server|<username>} <url>`

Parameter	Description
<trustpoint>	The name of the trustpoint for which the certificate and key are to be exported.
ca	If this option is specified, the command exports the root CA certificate and corresponding key.
server	If this option is specified, the command exports the server certificate and corresponding key.
<username>	If a RADIUS username is specified, the command exports the PKCS#12 file that was previously generated using the <code>crypto pki enroll user</code> command. To avoid ambiguity with keywords, the username may be prefixed by the string "user:".
<url>	The destination URL for the PKCS#12 file. The format of the URL is the same as any valid destination for a file copy command.

Mode Privileged Exec

Usage notes If the **ca** option is specified, this command exports the root CA certificate and the corresponding private key, if the trustpoint has been authenticated as a locally selfsigned CA. (If the trustpoint represents an external CA, then there is no private key on the system corresponding to the root CA certificate. Use the **crypto pki export pem** file to export the certificate by itself.) The command prompts for a passphrase to encrypt the private key.

If the **server** option is specified, this command exports the server certificate and the corresponding private key, if the server has been enrolled to the trustpoint. The command prompts for a passphrase to encrypt the private key.

If a RADIUS username is specified, this command exports the PKCS#12 file that was generated using the **crypto pki enroll user** command. (The key within the file was already encrypted as part of the user enrollment process.)

In the event that there is a RADIUS user named "ca" or "server", enter "user:ca" or "user:server" as the username.

The key and certificate must already exist.

Example To export the PKCS#12 file "example.pk12" for the trustpoint "example" to the URL "tftp://backup/", use the following commands:

```
awplus> enable
```

```
awplus# crypto pki export example pkcs12 ca tftp://backup/  
example.pk12
```

Related commands **crypto pki enroll user**
crypto pki export pem
crypto pki import pkcs12

crypto pki import pem

Overview This command imports a certificate for the given trustpoint from a file in Privacy-Enhanced Mail (PEM) format. The file may be transferred from the specified destination URL, or entered at the terminal.

Syntax `crypto pki import <trustpoint> pem [terminal|<url>]`

Parameter	Description
<trustpoint>	The name of the trustpoint for which the root CA certificate is to be imported.
terminal	Optional parameter, If specified, the command prompts the user to enter (or paste) the PEM file at the terminal. If parameter is specified terminal is assumed by default.
<url>	Optional parameter, If specified, the PEM file is transferred from the specified URL

Default The PEM will be imported from the terminal by default.

Mode Privileged Exec

Usage notes The command is generally used for trustpoints representing external certificate authorities. It accepts root CA certificates, intermediate CA certificates, and server certificates. The system automatically detects the certificate type upon import.

Using this command to import root CA certificates at the terminal is identical to the functionality provided by the `crypto pki authenticate` command, for external certificate authorities. The imported certificate is validated to ensure it is a proper CA certificate.

Intermediate CA certificates are validated to ensure they are proper CA certificates, and that the issuer chain ends in a root CA certificate already installed for the trustpoint. If there is no root CA certificate for the trustpoint (i.e., if the trustpoint is unauthenticated) then intermediate CA certificates may not be imported.

Server certificates are validated to ensure that the issuer chain ends in a root CA certificate already installed for the trustpoint. If there is no root CA certificate for the trustpoint (i.e., if the trustpoint is unauthenticated) then server certificates may not be imported.

The specified trustpoint must already exist. If the imported certificate is self-signed, then no certificates may exist for the trustpoint. Otherwise, the issuer's certificate must already be present for the trustpoint.

Example To import the PEM file for the trustpoint “example” from the terminal, use the following commands:

```
awplus> enable
```

```
awplus# crypto pki import example pem
```

To import the PEM file for the trustpoint “example” from the URL “tftp://server_a/”, use the following commands:

```
awplus> enable
```

```
awplus# crypto pki import example pem tftp://server_a/  
example.pem
```

Related commands

- crypto pki authenticate**
- crypto pki export pem**
- crypto pki trustpoint**

crypto pki import pkcs12

Overview This command imports a certificate and private key for an entity in a trustpoint from a file in PKCS#12 format at the specified URL. The command prompts for a passphrase to decrypt the private key within the file.

Syntax `crypto pki import <trustpoint> pkcs12 {ca|server} <url>`

Parameter	Description
<trustpoint>	The name of the trustpoint for which the certificate and key are to be imported.
ca	If this option is specified, the command imports the root CA certificate and corresponding key.
server	If this option is specified, the command imports the server certificate and corresponding key.
<url>	The source URL for the PKCS#12 file. The format of the URL is the same as any valid destination for a file copy command.

Mode Privileged Exec

Usage notes If the **ca** option is specified, this command imports the root CA certificate and the corresponding private key. This is only valid if the root CA certificate does not already exist for the trustpoint (i.e., if the trustpoint is unauthenticated).

If the **server** option is specified, this command imports the server certificate and the corresponding private key. The imported private key is given a new unique label of the form "localN", where N is a non-negative integer. This operation is only valid if the server certificate does not already exist for the trustpoint (i.e., if the server is not enrolled to the trustpoint).

PKCS#12 files for RADIUS users may not be imported with this command. (There is no value in doing so, as the files are not needed on the local system.)

The specified trustpoint must already exist. The key and certificate must not already exist.

Example To import the PKCS#12 file "example.pk12" for the trustpoint "example" to the URL "tftp://backup/", use the following commands:

```
awplus> enable
awplus# crypto pki import example pkcs12 ca tftp://backup/
example.pk12
```

Related [crypto pki export pkcs12](#)
commands [crypto pki import pem](#)

crypto pki trustpoint

Overview Use this command to declare the named trustpoint and enter trustpoint configuration mode.

Use the **no** variant of this command to destroy the trustpoint.

Syntax `crypto pki trustpoint <trustpoint>`
`no crypto pki trustpoint <trustpoint>`

Parameter	Description
<trustpoint>	The name of the trustpoint. The name must start with an alphanumeric character, and may only contain alphanumeric characters, underscores, dashes, or periods. The maximum length of the name is 63 characters.

Mode Global Configuration

Usage notes If the trustpoint did not previously exist, it is created as a new trustpoint. The trustpoint will be empty (unauthenticated) unless the name "local" is selected, in which case the system will automatically authenticate the trustpoint as a local self-signed certificate authority.

The **no** variant of this command destroys the trustpoint by removing all CA and server certificates associated with the trustpoint, as well as the private key associated with the root certificate (if the root certificate was locally self-signed). This is a destructive and irreversible operation, so this command should be used with caution.

Example To configure a trustpoint named "example", use the following commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
```

Related commands

- [enrollment \(ca-trustpoint\)](#)
- [fingerprint \(ca-trustpoint\)](#)
- [lifetime](#)
- [rsakeypair \(ca-trustpoint\)](#)
- [show crypto pki certificates](#)
- [show crypto pki trustpoint](#)

Command changes Version 5.4.6-1.1: command added to x930 Series
Version 5.4.8-1: command added to x220, XS900MX, x550 Series
Version 5.4.8-2.1: command added to SBx908 GEN2, x950 Series

crypto secure-mode

Overview Use this command to put the device into Secure Mode. When in Secure Mode, the following are disabled:

- Telnet
- SSHv1
- SNMPv1/v2
- All privilege levels except 1 and 15
- Algorithms that are not supported under FIPS, including MD5, RSA-1 and DSA
- The ability to store passwords in cleartext and to specify an **enable** password.

In Secure Mode, the web server on the device (used by the Device GUI) only accepts AES128-SHA ciphers.

NOTE: *Note: Stacking is not supported in Secure Mode.*

Use the **no** variant of this command to leave Secure Mode. You should delete all sensitive information first; see the ["Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide](#).

Syntax crypto secure-mode
no crypto secure-mode

Default By default, the device is not in Secure Mode.

Mode Global Configuration

Example For step-by-step instructions about how to enter and leave Secure Mode, see "How to Enable Secure Mode" in the ["Getting Started with AlliedWare Plus" Feature Overview and Configuration Guide](#).

Related commands [boot system](#)
[crypto key zeroize](#)
[crypto pki trustpoint](#)
[crypto verify](#)
[show secure-mode](#)

Command changes Version 5.4.6-1.1: command added to x930 Series
Version 5.4.8-1.2: command added to x220, XS900MX, x550 Series
Version 5.4.8-2.1: command added to SBx908 GEN2, x950 Series

crypto secure-mode delete hostkey

Overview Use this command to delete the encryption key used for securing configuration secrets in secure mode. Note that doing this will make these secrets impossible to decrypt, potentially impacting the device configuration.

Syntax `crypto secure-mode delete hostkey`

Default Not set.

Mode Privileged Exec

Example To delete the encrypted key, use the command:
`awplus# crypto secure-mode delete hostkey`

Related commands [radius-server host](#)
[radius-server key](#)
[ntp authentication-key](#)
[crypto secure-mode](#)

Command changes Version 5.4.9-2.1: command added

crypto verify

Overview Use this command to compare the SHA256 checksum of a file with its correct checksum. This confirms that the file has not been corrupted or interfered with during download. You can verify any kind of file, but you cannot specify a file path, so the file must be stored in the top level of the device's flash memory.



CAUTION: *If a file fails to verify and you believe the file may have been interfered with, we recommend immediately performing a security audit of your network.*

Once the device has verified the file, you can use the **copy running-config startup-config** command to save the file/hash pair in the running configuration. If you do this, the device will verify the file every time it boots up and will take action if the verification fails.

The action taken when verification fails on boot-up depends on the type of file and whether the device is in Secure Mode:

- If the device is in Secure Mode and the boot-up firmware file fails verification, the device will not boot. Contact Allied Telesis support if this happens.
- If the device is not in Secure Mode and the boot-up firmware file fails verification, the device will display the following warning message after booting: "% Verification Failed". If this occurs because the saved hash is incorrect, use this command to replace the hash. If this occurs because the firmware file is corrupted or may have been interfered with, ensure that your device is secure, then replace the failed file with a known good file and reboot.
- If you use the **gui** parameter and the GUI fails verification, the device will boot up but the GUI will be disabled (the **service http** command will be disabled).
- If any other file fails verification, the device will display the following warning message after booting: "% Verification Failed"

You can use the **show hash** command to see the current hash of a file.

Use the **no** variant of this command to remove a verified filename/hash combination from the running configuration.

Syntax `crypto verify <filename> <hash-value>`
`crypto verify gui <hash-value>`
`no crypto verify <filename>`

Parameter	Description
<code><filename></code>	The AlliedWare Plus file that you want to verify
<code>gui</code>	Verify the current Device GUI file
<code><hash-value></code>	The known correct checksum of the file. For firmware and GUI files, the correct checksum is listed in the sha256sum file that is available from the Allied Telesis Download Center.

Default No default

Mode Global Configuration

Usage notes All models of a particular series run the same firmware file and therefore have the same checksum for that firmware file. For example, all x930 Series switches have the same checksum.

If your network has extremely strict security requirements, such as FIPS compliance, you may need to verify the bootloader on boot-up and use signature verification for the firmware file. To configure these, use the commands **crypto verify bootrom** and **crypto verify signed**. These commands make it difficult to upgrade the bootloader or firmware, so only use them if necessary.

Examples To verify the firmware file for 5.5.3-0.1 on an x930 Series switch, use the commands:

```
awplus# configure terminal
awplus(config)# crypto verify x930-5.5.3-0.1.rel
7f22d8a30c991a4ddc0a2aed47246282b23b4e4a865e07f79795c0959c47de78
```

Related commands **crypto secure-mode**
crypto verify bootrom
crypto verify signed
show hash
show secure-mode

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices
Version 5.5.3-0.1: **gui** parameter added; **<filename>** parameter expanded to cover all file types

crypto verify bootrom

Overview Use this command to compare the SHA256 checksum hash value of a bootloader with its correct checksum. This confirms that the bootloader has not been corrupted or interfered with.

If the verification fails, contact Allied Telesis customer support.

If the device is in Secure Mode, running **crypto verify bootrom** also stores the hash value permanently. When in Secure Mode, we recommend only using this command in networks with extremely strict security requirements, such as in FIPS-compliant networks. This is because you can only remove the hash value by erasing flash memory (for example, by using the **erase factory-default** command).

If the device is not in Secure Mode, you can use the **write** command to save the hash value to the boot configuration file. The device will verify the checksum every time it boots up and will warn you if it fails the verification.

When not in Secure Mode, you can use the **no** variant of this command to remove the bootrom/hash combination from the running configuration.

Syntax `crypto verify bootrom <hash-value>`
`no crypto verify <filename>`

Parameter	Description
<code><hash-value></code>	The known correct checksum of the bootloader. To see the correct hash value, run the command show hash bootrom straight after you first boot the device up, or check the Deployment Guide for the device.

Default No default

Mode Global Configuration

Usage notes Please use this command in accordance with the User Guidance documentation for your required security certification.

All models of a particular series run the same bootloader file and therefore have the same checksum. For example, all x930 Series switches have the same bootloader checksum.

Examples To verify the bootrom file, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# crypto verify bootrom  
5e80e70b6a2200965abf5f62f72af1bdc1654f3726bdf554afcbd76270c91
```

Note that the hash in this example is an example only; it is not the hash of the device's bootloader.

Related commands

- crypto secure-mode**
- crypto verify**
- crypto verify signed**
- show hash**
- show secure-mode**

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices

crypto verify signed

Overview Use this command to compare the HMAC-SHA checksum hash value of a firmware file with its correct checksum. This confirms that the firmware has not been corrupted or interfered with. When the device is in Secure Mode, this command also forces the device to check the hash whenever it boots up, and prevents the device from booting if the verification fails.

Caution:

If the device is in Secure Mode, this command makes it difficult to upgrade the device's firmware file. Therefore, only use this command if the device is in Secure Mode and you have extremely strict security requirements, such as in FIPS-compliant networks. Otherwise, use the **crypto verify** command. See the Usage Notes below for more detail.

If the verification fails, contact Allied Telesis customer support.

Syntax `crypto verify signed <filename> <hash-value>`

Parameter	Description
<code><filename></code>	The AlliedWare Plus file that you want to verify
<code><hash-value></code>	The known correct checksum of the file. This is a keyed HMAC-SHA hash. This is available in a .sig file, which you can get from your Allied Telesis customer representative.

Default No default

Mode Global Configuration

Usage notes **Caution:**

If the device is in Secure Mode, and if the firmware file verified is the boot release and signed verification succeeds, then the device stores the signed hash and uses it to verify the firmware file on all subsequent reboots. This means that if you change the firmware version, the switch will not boot up. You can only change the firmware version if you reset the switch to the factory defaults **before** changing the firmware version, by using the command **erase factory-default**.

If the device is not in Secure Mode, you can use the **write** command to save the hash value to the boot configuration file. The device will verify the checksum every time it boots up and will warn you if it fails the verification.

All models of a particular series run the same release file and therefore have the same checksum. For example, all x930 Series switches have the same checksum.

Examples To use signature verification to verify the firmware file for 5.5.3-0.1 on an x930 Series switch, use the commands:

```
awplus# configure terminal
awplus(config)# crypto verify signed x930-5.5.3-0.1.rel
3f50420644aebd277dd48b3aee30639801348896ffffce231fc5615995ecde5d9
```

Related commands

- crypto secure-mode**
- crypto verify**
- crypto verify bootrom**
- show hash**
- show secure-mode**

Command changes Version 5.5.5-1.1: command available on all AlliedWare Plus devices

enrollment (ca-trustpoint)

Overview Use this command to declare how certificates will be added to the system for the current trustpoint.

Syntax enrollment {selfsigned|terminal|est|scep}

Parameter	Description
selfsigned	Sets the enrollment mode for the current trustpoint to selfsigned.
terminal	Sets the enrollment mode for the current trustpoint to terminal.
est	Sets the enrollment mode for the current trustpoint to Secure Transport (EST).
scep	Sets the enrollment mode for the current trustpoint to Simple Certificate Enrollment Protocol (SCEP).

Mode Trustpoint Configuration

Usage notes If the enrollment is set to **selfsigned**, then the system will generate a root CA certificate and its associated key when the **crypto pki authenticate** command is issued. It will generate a server certificate (signed by the root CA certificate) when the **crypto pki enroll** command is issued.

If the enrollment is set to **terminal**, then the system will prompt the user to paste the root CA certificate Privacy Enhanced Mail (PEM) file at the terminal, when the **crypto pki authenticate** command is issued. It will create a Certificate Signing Request (CSR) file for the local server when the **crypto pki enroll** command is issued. The server certificate received from the external CA should be imported using the **crypto pki import pem** command.

The trustpoint named "local" may only use the **selfsigned** enrollment setting.

If enrollment is set to **EST**, the system will contact the EST server specified by **est-url** when the **crypto pki authenticate** command is issued to retrieve the root CA certificate. When the **crypto pki enroll** command is issued, the system will generate a Certificate Signing Request (CSR) for the local server, send it to the EST server for signing, and, if successful, receive the signed server certificate.

If enrollment is set to **SCEP**, the system will contact the SCEP server specified by **scep-url** when the **crypto pki authenticate** command is issued to retrieve the root CA certificate. When the **crypto pki enroll** command is issued, the system will generate a Certificate Signing Request (CSR) for the local server, send it to the SCEP server for signing, and, if successful, receive the signed server certificate.

If no enrollment mode is specified, the **crypto pki authenticate** command will fail for the trustpoint.

Example To configure the trustpoint named "example" and set its enrollment to **selfsigned**, use the following commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# enrollment selfsigned
```

Related commands **crypto pki enroll**
crypto pki trustpoint
show crypto pki trustpoint

fingerprint (ca-trustpoint)

Overview Use this command to declare that certificates with the specified fingerprint should be automatically accepted, when importing certificates from an external certificate authority. This can affect the behavior of the **crypto pki authenticate** and **crypto pki import pem** commands.

Use the **no** variant of this command to remove the specified fingerprint from the pre-accepted list.

Syntax fingerprint <word>
no fingerprint <word>

Parameter	Description
<word>	The fingerprint as a series of 40 hexadecimal characters, optionally separated into multiple character strings.

Default By default, no fingerprints are pre-accepted for the trustpoint.

Mode Trustpoint Configuration

Usage notes Specifying a fingerprint adds it to a list of pre-accepted fingerprints for the trustpoint. When a certificate is imported, if it matches any of the pre-accepted values, then it will be saved in the system automatically. If the imported certificate's fingerprint does not match any pre-accepted value, then the user will be prompted to verify the certificate contents and fingerprint visually.

This command is useful when certificates from an external certificate authority are being transmitted over an insecure channel. If the certificate fingerprint is delivered via a separate messaging channel, then pre-entering the fingerprint value via cut-and-paste may be less errorprone than attempting to verify the fingerprint value visually.

The fingerprint is a series of 40 hexadecimal characters. It may be entered as a continuous string, or as a series of up to multiple strings separated by spaces. The input format is flexible because different certificate authorities may provide the fingerprint string in different formats.

Example To configure a fingerprint "5A81D34C 759CC4DA CFCA9F65 0303AD83 410B03AF" for the trustpoint named "example", use the following commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# fingerprint 5A81D34C 759CC4DA CFCA9F65
0303AD83 410B03AF
```

Related commands

- crypto pki authenticate**
- crypto pki import pem**
- crypto pki trustpoint**
- show crypto pki trustpoint**

lifetime

Overview Use this command to specify the lifetime of self-signed X.509 certificates as part of configuring the trustpoint. You can specify the certificate lifetime in days (1-3650), months (1-120) or years (1-10).

Use the **no** variant of this command to return to the default lifetime.

Syntax lifetime {days <1-3650>|months <1-120>|years <1-10>}
no lifetime

Parameter	Description
days <1-3650>	Specify the certificate lifetime in days
months <1-120>	Specify the certificate lifetime in months
years <1-10>	Specify the certificate lifetime in years

Default 5 years

Mode Trustpoint Configuration

Example To make the lifetime 10 years for the trustpoint named 'example', use the commands:

```
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# lifetime years 10
```

Related commands [crypto pki trustpoint](#)
[show crypto pki trustpoint](#)

Command changes Version 5.5.4-0.1: maximum increased to 10 years
Version 5.5.3-2.1: command added with maximum of 5 years

no crypto pki certificate

Overview Use this command to delete a certificate with the specified fingerprint from the specified trustpoint.

Syntax no crypto pki certificate *<trustpoint>* *<word>*

Parameter	Description
<i><trustpoint></i>	The name of the trustpoint.
<i><word></i>	The fingerprint as a series of 40 hexadecimal characters, optionally separated into multiple character strings.

Default By default, no fingerprints are pre-accepted for the trustpoint.

Mode Privileged Exec

Usage notes The fingerprint can be found in the output of the **show crypto pki certificates** command. If there are dependent certificates in the trustpoint (i.e., if other certificates were signed by the specified certificate), the command will be rejected.

If the specified certificate is the root CA certificate and the trustpoint represents a locally selfsigned CA, then the corresponding private key is also deleted from the system. Deleting the root CA certificate effectively resets the trustpoint to an unauthenticated state.

Example To delete a certificate with the fingerprint "594EDEF9 C7C4308C 36D408E0 77E784F0 A59E8792" from the trustpoint "example", use the following commands:

```
awplus> enable
awplus# no crypto pki certificate example
594EDEF9 C7C4308C 36D408E0 77E784F0 A59E8792
```

Related commands no **crypto pki trustpoint**
show crypto pki certificates

rsakeypair (ca-trustpoint)

Overview Use this command to declare which RSA key pair should be used to enroll the local server with the trustpoint. Note that this defines the key pair used with the server certificate, not the key pair used with the root CA certificate.

Use the **no** variant of this command to restore the default value, "server-default".

Syntax `rsakeypair <keylabel> [<1024-4096>]`
`no rsakeypair`

Parameter	Description
<keylabel>	The key to be used with the server certificate for this trustpoint. The name must start with an alphanumeric character, and may only contain alphanumeric characters, underscores, dashes, or periods. The maximum length of the name is 63 characters.
<1024-4096>	The bit length for the key, to be used if the key is implicitly generated during server enrollment.

Default The default value for **keylabel** is "server-default".

The default value for the key bit length is 2048.

Mode Trustpoint Configuration

Usage notes If the label specified does not refer to an existing key created by the **crypto key generate rsa** command, the key will be implicitly generated when the **crypto pki enroll** command is issued to generate the server certificate or the server certificate signing request. The optional numeric parameter defines the bit length for the key, and is only applicable for keys that are implicitly created during enrollment.

This command does not affect server certificates or server certificate signing requests that have already been generated. The trustpoint's server certificate is set to use whatever key pair was specified for the trustpoint at the time the **crypto pki enroll** command is issued.

The default key pair is "server-default". The default bit length is 2048 bits.

Example To configure trustpoint "example" to use the key pair "example-server-key" with a bit length of 2048, use the following commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# rsakeypair example-server-key 2048
```

Related commands [crypto key generate rsa](#)
[crypto pki trustpoint](#)
[show crypto pki trustpoint](#)

show crypto key mypubkey rsa

Overview Use this command to display information about the specified Rivest-Shamir-Adleman encryption key.

Syntax show crypto key mypubkey rsa [<keylabel>]

Parameter	Description
<keylabel>	The name of the key to be shown, if specified.

Default By default, all keys will be shown.

Mode Privileged Exec

Usage notes If no key label is specified, information about all keys is shown. The command displays the bit length of the key, a key fingerprint (a hash of the key contents to help uniquely identify a key), and a list of trustpoints in which the server certificate is using the key.

The specified keys must exist.

Example To show all keys, use the following commands:

```
awplus> enable
awplus# show crypto key mypubkey rsa
```

Output The following shows typical output.

Example output from show crypto key mypubkey rsa

```
awplus#show crypto key mypubkey rsa
-----
RSA Key Pair "example-server-key":
  Key size      : 2048 bits
  Fingerprint   : 1A605D73 C2274CB7 853886B3 1C802FC6 7CDE45FB
  Trustpoints   : example
-----
RSA Key Pair "server-default":
  Key size      : 2048 bits
  Fingerprint   : 34AC4D2D 5249A168 29D426A3 434FFC59 C4A19901
  Trustpoints   : local
```

Related commands [crypto key generate rsa](#)

show crypto pki certificates

Overview Use this command to display information about existing certificates for the specified trustpoint.

Syntax show crypto pki certificates [<trustpoint>]

Parameter	Description
<trustpoint>	The trustpoint for which the certificates are to be shown.

Default By default, the certificates for all trustpoints are shown.

Mode Privileged Exec

Usage notes If no trustpoint is specified, certificates for all trustpoints are shown. The command displays the certificates organized into certificate chains. It starts with the server certificate and then displays its issuer, and continues up the issuer chain until the root CA certificate is reached.

For each certificate, the command displays the certificate type, the subject's distinguished name (the entity identified by the certificate), the issuer's distinguished name (the entity that signed the certificate), the validity dates for the certificate, and the fingerprint of the certificate. The fingerprint is a cryptographic hash of the certificate contents that uniquely identifies the certificate.

The specified trustpoints must already exist.

Example To show the certificates for the trustpoint "example", use the following command:

```
awplus> enable
awplus# show crypto pki certificates example
```


Output The following shows typical output.

Example output from show crypto pki certificates

```
awplus>enable
awplus#show crypto pki certificates example
-----
Trustpoint "example" Certificate Chain
-----
Server certificate
  Subject       : /O=local/CN=local.loc.lc
  Issuer        : /C=NZ/CN=local_Signing_CA
  Valid From    : Nov 11 15:35:21 2015 GMT
  Valid To      : Aug 31 15:35:21 2018 GMT
  Fingerprint   : 5A81D34C 759CC4DA CFCA9F65 0303AD83 410B03AF
Intermediate CA certificate
  Subject       : /C=NZ/CN=example_Signing_CA
  Issuer        : /C=NZ/CN=example_Root_CA
  Valid From    : Sep 3 18:45:01 2015 GMT
  Valid To      : Oct 10 18:45:01 2020 GMT
  Fingerprint   : AE2D5850 9867D258 ABBEE95E 2E0E3D81 60714920
Imported root certificate
  Subject       : /C=NZ/CN=example_Root_CA
  Issuer        : /C=NZ/CN=example_Root_CA
  Valid From    : Jul 23 18:12:10 2015 GMT
  Valid To      : May 12 18:12:10 2025 GMT
  Fingerprint   : 594EDEF9 C7C4308C 36D408E0 77E784F0 A59E8792
```

Related commands [crypto pki trustpoint](#)

show crypto pki enrollment user

Overview Use this command to display a list of trustpoints for which RADIUS user enrollments have been performed, using the **crypto pki enroll user** command. This indicates that PKCS#12 files for the user are available for export for the given trustpoints, using the **crypto pki export pkcs12** command.

Syntax `crypto pki enrollment user <username>`

Parameter	Description
<code><username></code>	The user for which enrollments are to be shown.

Mode Privileged Exec

Example To show the list of trustpoints to which user "exampleuser1" is enrolled, use the following commands:

```
awplus> enable
awplus(config)# show crypto pki enrollment user exampleuser1
```

Output The following shows typical output.

Example output from show crypto pki enrollment user

```
awplus> enable
awplus# show crypto pki enrollment user exampleuser1
User "exampleuser1" is enrolled to the following trustpoints:
local, example
```

Related commands [crypto pki enroll user](#)
[crypto pki export pkcs12](#)

show crypto pki trustpoint

Overview Use this command to display information about the specified trustpoint.

Syntax show crypto pki trustpoint [*<trustpoint>*]

Parameter	Description
<i><trustpoint></i>	The name of the trustpoint to be shown

Default By default, all trustpoints are shown.

Mode Privileged Exec

Usage notes If no trustpoint is specified, information about all trustpoints is shown. The command displays the authentication status of the trustpoint, the fingerprint of the root CA certificate (if it exists), the enrollment status of the local server with the trustpoint, a list of any applications that are configured to use the trustpoint, and the trustpoint parameters that were configured from trustpoint-configuration mode.

The specified trustpoints must already exist.

Example To show the details of the trustpoint "example", use the following commands:

```
awplus> enable
awplus# show crypto pki trustpoint example
```

Output The following shows typical output.

Example output from show crypto pki trustpoint

```
awplus> enable
awplus# show crypto pki trustpoint example
-----
Trustpoint "example"
  Type           : Self-signed certificate authority
  Root Certificate: 50C1856B EEC7555A 0F3A61F6 690D9463 67DF74D1
  Local Server   : The server is enrolled to this trustpoint.
  Server Key     : example-server-key
  Applications   : RADIUS

Authentication and Enrollment Parameters:
  Enrollment     : selfsigned
  RSA Key Pair   : example-server-key (2048 bits)
  Lifetime       : 120 months
-----
```

Related **crypto pki trustpoint**
commands **show crypto pki certificates**

show hash

Overview Use this command to display the hash for a specified file on the device, or for the device's current bootloader.

Syntax show hash <filename>
show hash bootrom

Parameter	Description
<filename>	The name of the file to display the hash for.
bootrom	Display the hash for the current bootloader.

Mode Privileged Exec

Examples To show the hash for the GUI file named awplus-gui_552_27.gui, use the command:

```
awplus# show hash awplus-gui_552_27.gui
```

To show the hash for a file named 'example.txt', which is in the folder named 'example' in flash memory, use the command:

```
awplus# show hash flash://example/example.txt
```

To show the hash for the bootloader, use the command:

```
awplus# show hash bootrom
```

Output The following shows typical output.

Example output from show hash

```
awplus#show hash awplus-gui_552_27.gui  
b793e2c7fc5580513472017f964316f3bb0e79fbf1ddfd6f3844a2a8311c5c64
```

Related commands [crypto secure-mode](#)
[crypto verify](#)
[crypto verify bootrom](#)

Command changes Version 5.5.3-0.1: command added

show secure-mode

Overview Use this command to see whether secure mode is enabled or not. Secure mode disables a number of insecure features, such as Telnet.

Syntax show secure-mode

Mode User Exec/Privileged Exec

Example To see if secure mode is enabled, use the command:
awplus# show secure-mode

Output The following shows typical output.

Example output from show secure-mode

```
awplus#show secure-mode  
Secure mode is enabled
```

Related commands [crypto secure-mode](#)

subject-name (ca-trustpoint)

Overview Use this command to specify the distinguished name string that should be used for the subject field in the server certificate, when enrolling the server (generating the server certificate or server certificate signing request).

Syntax subject-name <word>

Parameter	Description
<word>	Specify the subject name as a distinguished name string. Complex strings (e.g., strings containing spaces) should be surrounded with double-quote characters.

Default If no subject name is specified for the trustpoint, then the system automatically builds a name of the form "/O=AlliedWare Plus/CN=xxxx.yyyy.zzz", where "xxxx" is the hostname of the system and "yyy.zzz" is the default search domain for the system.

Mode Trustpoint Configuration

Usage notes The subject name is specified as a variable number of fields, where each field begins with a forward-slash character ("/"). Each field is of the form "XX=value", where "XX" is the abbreviation of the node type in the tree.

Common values include:

- "C" (country),
- "ST" (state),
- "L" (locality),
- "O" (organization),
- "OU" (organizational unit), and
- "CN" (common name).

Of these fields, "CN" is usually the most important.

NOTE: For a server certificate, many applications require that the network name of the server matches the common name in the server's certificate.

Example To configure the trustpoint named "example" and set its subject name, use the following commands:

```
awplus> enable
awplus# configure terminal
awplus(config)# crypto pki trustpoint example
awplus(ca-trustpoint)# subject-name "/O=My Company/
CN=192.168.1.1
```

Related `crypto pki enroll`
commands

49

TACACS+ Commands

- Contents**
- **Introduction** on page 2526
 - **aaa authorization commands** on page 2527
 - **aaa authorization config-commands** on page 2529
 - **authorization commands** on page 2530
 - **ip tacacs source-interface** on page 2532
 - **show tacacs+** on page 2534
 - **tacacs-server host** on page 2536
 - **tacacs-server key** on page 2538
 - **tacacs-server timeout** on page 2540

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure the device to use TACACS+ servers. For more information about TACACS+, see the **TACACS+ Feature Overview and Configuration Guide**.

TACACS+ is not available in Secure Mode (see the **crypto secure-mode** command).

aaa authorization commands

Overview This command configures a method list for commands authorization that can be applied to console or VTY lines. When command authorization is enabled for a privilege level, only authorized users can executed commands in that privilege level.

Use the **no** variant of this command to remove a named method list or disable the default method list for a privilege level.

Syntax `aaa authorization commands <privilege-level> {default|<list-name>} group tacacs+ [none]`
`no aaa authorization commands <privilege-level> {default|<list-name>}`

Parameter	Description
<privilege-level>	The privilege level of the set of commands the method list will be applied to. AlliedWare Plus defines three sets of commands, that are indexed by a level value: Level = 1: All commands that can be accessed by a user with privilege level between 1 and 6 inclusive Level = 7: All commands that can be accessed by a user with privilege level between 7 and 14 inclusive Level = 15: All commands that can be accessed by a user with privilege level 15
group	Specify the server group where authorization messages are sent. Only the tacacs+ group is available for this command.
tacacs+	Use all TACACS+ servers configured by the tacacs-server host command.
default	Configure the default authorization commands method list.
<list-name>	Configure a named authorization commands method list
none	If specified, this provides a local fallback to command authorization so that if authorization servers become unavailable then the device will accept all commands normally allowed for the privilege level of the user.

Mode Global Configuration

Usage notes TACACS+ command authorization provides centralized control of the commands available to a user of an AlliedWare Plus device. Once enabled:

- The command string and username are encrypted and sent to the first available configured TACACS+ server (the first server configured) for authorization.
- The TACACS+ server decides if the user is authorized to execute the command and returns the decision to the AlliedWare Plus device.
- Depending on this decision the device will then either execute the command or notify the user that authorization has failed.

If multiple TACACS+ servers are configured, and the first server is unreachable or does not respond, the other servers will be queried, in turn, for an authorization decision. If all servers are unreachable and a local fallback has been configured, with the **none** parameter, then commands are authorized based on the user's privilege level; the same behavior as if command authorization had not been configured. If, however, the local fallback is not configured and all servers become unreachable then all commands except **logout**, **exit**, and **quit** will be denied.

The **default** method list is defined with a local fallback unless configured differently using this command.

Example To configure a commands authorization method list, named TAC15, using all TACACS+ servers to authorize commands for privilege level 15, with a local fallback, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authorization commands 15 TAC15 group tacacs  
+ none
```

To configure the default method list to authorize commands for privilege level 7, with no local fallback, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# aaa authorization commands 7 default group  
tacacs+
```

To remove the authorization method list TAC15, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no aaa authorization commands 15 TAC15
```

Related commands [aaa authorization config-commands](#)
[authorization commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

aaa authorization config-commands

Overview Use this command to enable command authorization on configuration mode commands. By default, command authorization applies to commands in exec mode only.

Use the **no** variant of this command to disable command authorization on configuration mode commands.

Syntax `aaa authorization config-commands`
`no aaa authorization config-commands`

Default By default, command authorization is disabled on configuration mode commands.

Mode Global Configuration

Usage notes If authorization of configuration mode commands is not enabled then all configuration commands are accepted by default, including command authorization commands.

NOTE: *Authorization of configuration commands is required for a secure TACACS+ command authorization configuration as it prevents the feature from being disabled to gain access to unauthorized exec mode commands.*

Example To enable command authorization for configuration mode commands, use the commands:

```
awplus# configure terminal
awplus(config)# aaa authorization config-commands
```

To disable command authorization for configuration mode commands, use the commands:

```
awplus# configure terminal
awplus(config)# no aaa authorization config-commands
```

Related commands [aaa authorization commands](#)
[authorization commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

authorization commands

Overview This command applies a command authorization method list, defined using the **aaa authorization commands** command, to console and VTY lines.

Use the **no** variant of this command to reset the command authorization configuration on the console and VTY lines.

Syntax authorization commands <privilege-level> {default|<list-name>}
no authorization commands <privilege-level>

Parameter	Description
<privilege-level>	The privilege level of the set of commands the method list will be applied to. AlliedWare Plus defines three sets of commands, that are indexed by a level value: Level = 1: All commands that can be accessed by a user with privilege level between 1 and 6 inclusive Level = 7: All commands that can be accessed by a user with privilege level between 7 and 14 inclusive Level = 15: All commands that can be accessed by a user with privilege level 15
default	Configure the default authorization commands method list.
<list-name>	Configure a named authorization commands method list

Default The **default** method list is applied to each console and VTY line by default.

Mode Line Configuration

Usage notes If the specified method list does not exist users will not be able to execute any commands in the specified method list on the specified VTY lines.

Example To apply the TAC15 command authorization method list with privilege level 15 to VTY lines 0 to 5, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# authorization commands 15 TAC15
```

To reset the command authorization configuration with privilege level 15 on VTY lines 0 to 5, use the following commands:

```
awplus# configure terminal
awplus(config)# line vty 0 5
awplus(config-line)# no authorization commands 15
```

Related commands [aaa authorization commands](#)
[aaa authorization config-commands](#)
[tacacs-server host](#)

Command changes Version 5.4.6-2.1: command added

ip tacacs source-interface

Overview This command sets the source interface, or IP address, to use for all TACACS+ packets sent from the device. By default, TACACS+ packets use the source IP address of the egress interface.

Use the **no** variant of this command to remove the source interface configuration and use the source IP address of the egress interface.

Syntax `ip tacacs source-interface {<interface>|<ip-address>}`
`no ip tacacs source-interface`

Parameter	Description
<interface>	Interface name.
<ip-address>	IP address in the dotted decimal format A.B.C.D.

Default The source IP address of outgoing TACACS+ packets default to the IP address of the egress interface.

Mode Global Configuration

Usage notes Setting the source interface ensures that all TACACS+ packets sent from the device will have the same source IP address. Once configured this affects all TACACS+ packets, namely accounting, authentication, and authorization.

If the specified interface is down or there is no IP address on the interface, then the source IP address of outgoing TACACS+ packets will default to the IP address of the egress interface.

Example To configure all outgoing TACACS+ packets to use the IP address of the loop-back "lo" interface as the source IP address, use the following commands:

```
awplus# configure terminal
awplus(config)# ip tacacs source-interface lo
```

To reset the source interface configuration for all TACACS+ packets, use the following commands:

```
awplus# configure terminal
awplus(config)# no ip tacacs source-interface
```

Related commands [tacacs-server host](#)
[show tacacs+](#)

Command changes Version 5.4.6-2.1: command added

show tacacs+

Overview This command displays the current TACACS+ server configuration and status.

Syntax show tacacs+

Mode User Exec and Privileged Exec

Example To display the current status of TACACS+ servers, use the command:
awplus# show tacacs+

Output The following shows typical output.

Example output from the show tacacs+ command

TACACS+ Global Configuration	
Source Interface	: not configured
Timeout	: 5 sec
Server Host/ IP Address	Server Status

192.168.1.10	Alive
192.168.1.11	Unknown

Parameters in the output of the show tacacs+ command

Output Parameter	Meaning
Source Interface	IP address of source interface if set with ip tacacs source-interface .
Timeout	A time interval in seconds.
Server Host/IP Address	TACACS+ server hostname or IP address.
Server Status	The status of the authentication port.
	Alive The server is alive.
	Dead The server has timed out.
	Error The server is not responding or there is an error in the key string entered.
	Unknown The server is never used or the status is unknown.
	Unreachable The server is unreachable.
	Unresolved The server name can not be resolved.

Command changes Version 5.4.6-2.1: **Source Interface** parameter added

tacacs-server host

Overview Use this command to specify a remote TACACS+ server host for authentication, authorization and accounting, and to set the shared secret key to use with the TACACS+ server. The parameters specified with this command override the corresponding global parameters for TACACS+ servers.

Use the **no** variant of this command to remove the specified server host as a TACACS+ authentication and authorization server.

Syntax tacacs-server host {<host-name>|<ip-address>} [key [8|9] <key-string>]
no tacacs-server host {<host-name>|<ip-address>}

Parameter	Description
<host-name>	Server host name. The DNS name of the TACACS+ server host.
<ip-address>	The IP address of the TACACS+ server host, in dotted decimal notation A.B.C.D.
key	Set shared secret key with TACACS+ servers.
8	Specifies a string in a DES encrypted format instead of plain text. DES has been deprecated and should not be used. The default encryption format is now AES.
9	Specifies a string in an AES encrypted format instead of plain text. This is the default.
<key-string>	Shared key string applied, a value in the range 1 to 64 characters. Specifies the shared secret authentication or encryption key for all TACACS+ communications between this device and the TACACS+ server. This key must match the encryption used on the TACACS+ server. This setting overrides the global setting of the tacacs-server key command. If no key value is specified, the global value is used.

Default No TACACS+ server is configured by default.

Mode Global Configuration

Usage A TACACS+ server host cannot be configured multiple times like a RADIUS server.

As many as four TACACS+ servers can be configured and consulted for login authentication, enable password authentication and accounting. The first server configured is regarded as the primary server and if the primary server fails then the backup servers are consulted in turn. A backup server is consulted if the primary server fails, not if a login authentication attempt is rejected. The reasons a server would fail are:

- it is not network reachable
- it is not currently TACACS+ capable
- it cannot communicate with the switch properly due to the switch and the server having different secret keys

Examples To add the server tac1.company.com as the TACACS+ server host, use the following commands:

```
awplus# configure terminal
awplus(config)# tacacs-server host tac1.company.com
```

To set the secret key to 'secret' on the TACACS+ server 192.168.1.1, use the following commands:

```
awplus# configure terminal
awplus(config)# tacacs-server host 192.168.1.1 key secret
```

To remove the TACACS+ server tac1.company.com, use the following commands:

```
awplus# configure terminal
awplus(config)# no tacacs-server host tac1.company.com
```

Related commands

- [aaa accounting commands](#)
- [aaa authentication login](#)
- [tacacs-server key](#)
- [tacacs-server timeout](#)
- [show tacacs+](#)

Command changes

- Version 5.5.4-0.1: DES encrypted format deprecated
- Version 5.5.2-1.1: **vrf** parameter added for products that support VRF

tacacs-server key

Overview This command sets a global secret key for TACACS+ authentication, authorization and accounting. The shared secret text string is used for TACACS+ communications between the switch and all TACACS+ servers.

Note that if no secret key is explicitly specified for a TACACS+ server with the **tacacs-server host** command, this global secret key will be used for the shared secret for the server.

Use the **no** variant of this command to remove the global secret key.

Syntax tacacs-server key [8|9] <key-string>
no tacacs-server key

Parameter	Description
8	Specifies a string in a DES encrypted format instead of plain text. DES has been deprecated and should not be used. The default encryption format is now AES.
9	Specifies a string in an AES encrypted format instead of plain text.
<key-string>	Shared key string applied, a value in the range 1 to 64 characters. Specifies the shared secret authentication or encryption key for all TACACS+ communications between this device and all TACACS+ servers. This key must match the encryption used on the TACACS+ server.

Default AES encrypted format

Mode Global Configuration

Usage notes Use this command to set the global secret key shared between this client and its TACACS+ servers. If no secret key is specified for a particular TACACS+ server using the **tacacs-server host** command, this global key is used.

Examples To set the global secret key to secret for TACACS+ server, use the following commands:

```
awplus# configure terminal
awplus(config)# tacacs-server key secret
```

To delete the global secret key for TACACS+ server, use the following commands:

```
awplus# configure terminal
awplus(config)# no tacacs-server key
```

Related commands **tacacs-server host**
show tacacs+

Command changes Version 5.5.4-0.1: DES encrypted format deprecated

tacacs-server timeout

Overview Use this command to specify the TACACS+ global timeout value. The timeout value is how long the device waits for a reply to a TACACS+ request before considering the server to be dead.

Note that this command configures the **timeout** parameter for TACACS+ servers globally.

The **no** variant of this command resets the transmit timeout to the default (5 seconds).

Syntax tacacs-server timeout <seconds>
no tacacs-server timeout

Parameter	Description
<seconds>	TACACS+ server timeout in seconds, in the range 1 to 1000.

Default The default timeout value is 5 seconds.

Mode Global Configuration

Examples To set the timeout value to 3 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# tacacs-server timeout 3
```

To reset the timeout period for TACACS+ servers to the default, use the following commands:

```
awplus# configure terminal
awplus(config)# no tacacs-server timeout
```

Related commands [tacacs-server host](#)
[show tacacs+](#)

50 DHCP Snooping Commands

- Contents**
- **Introduction** on page 2543
 - **arp security** on page 2544
 - **arp security drop link-local-arps** on page 2545
 - **arp security violation** on page 2547
 - **clear arp security statistics** on page 2549
 - **clear ip dhcp snooping binding** on page 2550
 - **clear ip dhcp snooping statistics** on page 2551
 - **debug arp security** on page 2552
 - **debug ip dhcp snooping** on page 2553
 - **ip dhcp snooping** on page 2554
 - **ip dhcp snooping agent-option** on page 2556
 - **ip dhcp snooping agent-option allow-untrusted** on page 2557
 - **ip dhcp snooping agent-option circuit-id vlantriple** on page 2558
 - **ip dhcp snooping agent-option remote-id** on page 2559
 - **ip dhcp snooping binding** on page 2561
 - **ip dhcp snooping database** on page 2563
 - **ip dhcp snooping delete-by-client** on page 2564
 - **ip dhcp snooping delete-by-linkdown** on page 2565
 - **ip dhcp snooping disable-l2-flooding** on page 2566
 - **ip dhcp snooping max-bindings** on page 2567
 - **ip dhcp snooping subscriber-id** on page 2569
 - **ip dhcp snooping trust** on page 2570
 - **ip dhcp snooping verify mac-address** on page 2571
 - **ip dhcp snooping violation** on page 2572
 - **ip source binding** on page 2574
 - **service dhcp-snooping** on page 2576
 - **show arp security** on page 2579
 - **show arp security interface** on page 2580
 - **show arp security statistics** on page 2582
 - **show debugging arp security** on page 2585
 - **show debugging ip dhcp snooping** on page 2586
 - **show ip dhcp snooping** on page 2587
 - **show ip dhcp snooping acl** on page 2588
 - **show ip dhcp snooping agent-option** on page 2591
 - **show ip dhcp snooping binding** on page 2593
 - **show ip dhcp snooping interface** on page 2595
 - **show ip dhcp snooping statistics** on page 2597

- [**show ip source binding**](#) on page 2600

Introduction

Overview This chapter gives detailed information about the commands used to configure DHCP snooping. For detailed descriptions of related ACL commands, see [IPv4 Hardware Access Control List \(ACL\) Commands](#). For more information about DHCP snooping, see the [DHCP Snooping Feature Overview and Configuration Guide](#).

DHCP snooping can operate on static link aggregators (e.g. sa2) and dynamic link aggregators (e.g. po2), as well as on switch ports (e.g. port1.0.2).

arp security

Overview Use this command to enable ARP security on untrusted ports in the VLANs, so that the switch only responds to/forwards ARP packets if they have recognized IP and MAC source addresses.

Use the **no** variant of this command to disable ARP security on the VLANs.

Syntax arp security
no arp security

Default Disabled

Mode Interface Configuration (VLANs)

Usage Enable ARP security to provide protection against ARP spoofing. DHCP snooping must also be enabled on the switch (**service dhcp-snooping**), and on the VLANs (**ip dhcp snooping**).

Example To enable ARP security on VLANs 2 to 4, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# arp security
```

Related commands **arp security violation**
show arp security
show arp security interface
show arp security statistics

arp security drop link-local-arps

Overview Use this command to enable ARP security on a per-port basis. This means that IPv4 link-local ARPs will be dropped without causing an ARP security violation when received.

Use the **no** variant of this command to return to the default setting of disabled.

Syntax arp security drop link-local-arps
no arp security drop link-local-arps

Default Disabled by default.

Mode Interface Configuration

Usage notes Hosts that implement RFC 3927 may automatically assign themselves link-local IPv4 addresses in the subnet 169.254.0.0/16, if they are configured to learn their IP addresses via DHCP but are unable to contact a DHCP server. This is common behavior for all versions of Microsoft Windows since Windows XP. In an attempt to avoid IP address collision with other devices on the local network, the host will broadcast ARP probes for its randomly selected link-local IP address.

By default, ARP security will treat these ARP probes as violations and carry out the configured violation action on the port they are received on. If the violation action is configured as link-down, this will result in the host being disconnected from the network, which will interrupt any DHCP IP address discovery that was in progress.

Use this command to configure ARP Security to drop these ARP probes, and any other ARPs that contain link-local IP addresses, without raising a violation on the affected port. The count of ARPs dropped in this manner can be seen in the output of **show arp security statistics detail**.

Example To configure ARP security to drop IPv4 link local ARPs on port1.0.1 to port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# arp security drop link-local-arps
```

Related commands [arp security](#)
[arp security violation](#)
[show arp security statistics](#)

Command changes Version 5.4.9-1.1: command added.

arp security violation

Overview Use this command to specify an additional action to perform if an ARP security violation is detected on the ports. ARP security must also be enabled (**arp security**).

Use the **no** variant of this command to remove the specified action, or all actions. Traffic violating ARP security will be dropped, but no other action will be taken.

Syntax `arp security violation {log|trap|link-down} ...`
`no arp security violation [log|trap|link-down] ...`

Parameter	Description
log	Generate a log message. To display these messages, use the show log .
trap	Generate an SNMP notification (trap). To send SNMP notifications, SNMP must also be configured, and DHCP snooping notifications must be enabled using the snmp-server enable trap. Notifications are limited to one per second and to one per source MAC and violation reason. Additional violations within a second of a notification being sent will not result in further notifications. Default: disabled.
link-down	Shut down the port that received the packet. Default: disabled.

Default When the switch detects an ARP security violation, it drops the packet. By default, it does not perform any other violation actions.

Mode Interface Configuration (switch ports, static or dynamic aggregated links)

Usage notes When the switch detects an ARP security violation on an untrusted port in a VLAN that has ARP security enabled, it drops the packet. This command sets the switch to perform additional actions in response to ARP violations.

If a port has been shut down in response to a violation, to bring it back up again after any issues have been resolved, use the **shutdown**.

Example To send SNMP notifications for ARP security violations on ports 1.0.1 to 1.0.6, use the commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap dhcpsnooping
awplus(config)# interface port1.0.1-port1.0.6
awplus(config-if)# arp security violation trap
```

Related commands

- arp security**
- show arp security interface**
- show arp security statistics**
- show log**
- snmp-server enable trap**

clear arp security statistics

Overview Use this command to clear ARP security statistics for the specified ports, or for all ports.

Syntax clear arp security statistics [interface <port-list>]

Parameter	Description
<port-list>	The ports to clear statistics for. If no ports are specified, statistics are cleared for all ports. The ports may be switch ports, or static or dynamic link aggregators.

Mode Privileged Exec

Example To clear statistics for ARP security on interface port1.0.1, use the command:

```
awplus# clear arp security statistics interface port1.0.1
```

Related commands

- [arp security violation](#)
- [show arp security](#)
- [show arp security statistics](#)

clear ip dhcp snooping binding

Overview Use this command to remove one or more DHCP Snooping dynamic entries from the DHCP Snooping binding database. If no options are specified, all entries are removed from the database.



CAUTION:

Syntax `clear ip dhcp snooping binding [<ipaddr>] [interface <port-list>] [vlan <vid-list>]`

Parameter	Description
<ipaddr>	Remove the entry for this client IP address.
<port-list>	Remove all entries for these ports. The port list may contain switch ports, and static or dynamic link aggregators (channel groups).
<vid-list>	Remove all entries associated with these VLANs.

Mode Privileged Exec

Usage This command removes dynamic entries from the database. Note that dynamic entries can also be deleted by using the **no** variant of the **ip dhcp snooping binding**.

Dynamic entries can individually restored by using the **ip dhcp snooping binding** command.

To remove static entries, use the **no** variant of the **ip source binding**.

Example To remove a dynamic lease entry from the DHCP snooping database for a client with the IP address 192.168.1.2, use the command:

```
awplus# clear ip dhcp snooping binding 192.168.1.2
```

Related commands

- ip dhcp snooping binding**
- ip source binding**
- show ip dhcp snooping binding**

clear ip dhcp snooping statistics

Overview Use this command to clear DHCP snooping statistics for the specified ports, or for all ports.

Syntax `clear ip dhcp snooping statistics [interface <port-list>]`

Parameter	Description
<port-list>	The ports to clear statistics for. If no ports are specified, statistics are cleared for all ports. The port list can contain switch ports, or static or dynamic link aggregators.

Mode Privileged Exec

Example To clear statistics for the DHCP snooping on interface port1.0.1, use the command:

```
awplus# clear ip dhcp snooping statistics interface port1.0.1
```

Related commands

- [clear arp security statistics](#)
- [show ip dhcp snooping](#)
- [show ip dhcp snooping statistics](#)

debug arp security

Overview Use this command to enable ARP security debugging.

Use the **no** variant of this command to disable debugging for ARP security.

Syntax debug arp security
no debug arp security

Default Disabled

Mode Privileged Exec

Example To enable ARP security debugging, use the commands:

```
awplus# debug arp security
```

Related commands [show debugging arp security](#)
[show log](#)
[terminal monitor](#)

debug ip dhcp snooping

Overview Use this command to enable the specified types of debugging for DHCP snooping.

Use the **no** variant of this command to disable the specified types of debugging.

Syntax debug ip dhcp snooping {all|acl|db|packet [detail]}
no debug ip dhcp snooping {all|acl|db|packet [detail]}

Parameter	Description
all	All DHCP snooping debug.
acl	DHCP snooping access list debug.
db	DHCP snooping binding database debug.
packet	DHCP snooping packet debug. For the no variant of this command, this option also disables detailed packet debug, if it was enabled.
detail	Detailed packet debug.

Default Disabled

Mode Privileged Exec

Example To enable access list debugging for DHCP snooping, use the commands:

```
awplus# debug ip dhcp snooping acl
```

Related commands [debug arp security](#)
[show debugging ip dhcp snooping](#)
[show log](#)
[terminal monitor](#)

ip dhcp snooping

Overview Use this command to enable DHCP snooping on one or more VLANs.
Use the **no** variant of this command to disable DHCP snooping on the VLANs.

Syntax ip dhcp snooping
no ip dhcp snooping

Default DHCP snooping is disabled on VLANs by default.

Mode Interface Configuration (VLANs)

Usage notes Enabling DHCP snooping

For DHCP snooping to operate on a VLAN, you must:

- enable the service on the switch by using the **service dhcp-snooping** command, and
- enable DHCP snooping on the particular VLAN by using the **ip dhcp snooping** command, and
- if there is an external DHCP server, configure the port connected to the server as a trusted port, by using the **ip dhcp snooping trust** command

Disabling DHCP snooping

Use **no service dhcp-snooping** to disable DHCP snooping.

Disabling DHCP snooping removes all DHCP snooping configuration from the running configuration, except for:

- any DHCP snooping maximum bindings settings (**ip dhcp snooping max-bindings**), and
- any additional DHCP snooping-based ACLs you have created for filtering on untrusted ports.

You must remove any such additional DHCP snooping-based ACLs, using the **no access-group** command. This is because these ACLs block all traffic except for traffic that matches DHCP snooping entries. Once you have disabled DHCP snooping, these ACLs will block all traffic. Note that if you disable DHCP snooping on particular VLANs (using the **no ip dhcp snooping** command), you need to make sure you remove any such additional ACLs that apply to those VLANs.

If you re-enable the service, the switch repopulates the DHCP snooping database from the dynamic lease entries in the database backup file (see the **ip dhcp snooping database** command). It also updates the lease expiry times.

Examples To enable DHCP snooping on VLANs 2 to 4, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# ip dhcp snooping
```

To disable DHCP snooping on the switch, use the command:

```
awplus# configure terminal
awplus(config)# interface vlan2-vlan4
awplus(config-if)# no ip dhcp snooping
```

Related commands

- ip dhcp snooping trust**
- service dhcp-snooping**
- show ip dhcp snooping**

ip dhcp snooping agent-option

Overview Use this command to enable DHCP Relay Agent Option 82 information insertion on the switch. When this is enabled, the switch:

- inserts DHCP Relay Agent Option 82 information into DHCP packets that it receives on untrusted ports
- removes DHCP Relay Agent Option 82 information from DHCP packets that it sends to untrusted ports.

Use the **no** variant of this command to disable DHCP Relay Agent Option 82 insertion.

Syntax ip dhcp snooping agent-option
no ip dhcp snooping agent-option

Default DHCP Relay Agent Option 82 insertion is enabled by default when DHCP snooping is enabled.

Mode Global Configuration

Usage notes DHCP snooping must also be enabled on the switch (**service dhcp-snooping**), and on the VLANs (**ip dhcp snooping**).

If a subscriber ID is configured for the port (**ip dhcp snooping subscriber-id**), the switch includes this in the DHCP Relay Agent Option 82 information it inserts into DHCP packets received on the port.

Example To disable DHCP Relay Agent Option 82 on the switch, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp snooping agent-option
```

Related commands **ip dhcp snooping**
ip dhcp snooping agent-option allow-untrusted
ip dhcp snooping subscriber-id
service dhcp-snooping
show ip dhcp snooping

ip dhcp snooping agent-option allow-untrusted

Overview Use this command to enable DHCP Relay Agent Option 82 information reception on untrusted ports. When this is enabled, the switch accepts incoming DHCP packets that contain DHCP Relay Agent Option 82 information on untrusted ports.

Use the **no** variant of this command to disable DHCP Relay Agent Option 82 information reception on untrusted ports.

Syntax ip dhcp snooping agent-option allow-untrusted
no ip dhcp snooping agent-option allow-untrusted

Default Disabled

Mode Global Configuration

Usage notes If the switch is connected via untrusted ports to edge switches that insert DHCP Relay Agent Option 82 information into DHCP packets, you may need to allow these DHCP packets through the untrusted ports, by using this command.

When this is disabled (default), the switch treats incoming DHCP packets on untrusted ports that contain DHCP Relay Agent Option 82 information as DHCP snooping violations: it drops them and applies any violation action specified by the **ip dhcp snooping violation**. The switch stores statistics for packets dropped; to display these statistics, use the **show ip dhcp snooping statistics**.

Example To enable DHCP snooping Option 82 information reception on untrusted ports, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp snooping agent-option allow-untrusted
```

Related commands **ip dhcp snooping agent-option**
ip dhcp snooping violation
show ip dhcp snooping
show ip dhcp snooping statistics

ip dhcp snooping agent-option circuit-id vlantriplet

Overview Use this command to specify the Circuit ID sub-option of the DHCP Relay Agent Option 82 field as the VLAN ID and port number. The Circuit ID specifies the switch port and VLAN ID that the client-originated DHCP packet was received on.

Use the **no** variant of this command to set the Circuit ID to the default, the VLAN ID and Ifindex (interface number).

Syntax `ip dhcp snooping agent-option circuit-id vlantriplet`
`no ip dhcp snooping agent-option circuit-id`

Default By default, the Circuit ID is the VLAN ID and Ifindex (interface number).

Mode Interface Configuration for a VLAN interface.

Usage The Circuit ID sub-option is included in the DHCP Relay Agent Option 82 field of forwarded client DHCP packets:

- DHCP snooping Option 82 information insertion is enabled (**ip dhcp snooping agent-option**; enabled by default), and
- DHCP snooping is enabled on the switch (**service dhcp-snooping**) and on the VLAN to which the port belongs (**ip dhcp snooping**)

Examples To set the Circuit ID to `vlantriplet` for client DHCP packets received on `vlan1`, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip dhcp snooping agent-option circuit-id
vlantriplet
```

To return the Circuit ID format to the default for `vlan1`, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# no ip dhcp snooping agent-option circuit-id
```

Related commands **ip dhcp snooping agent-option**
ip dhcp snooping agent-option remote-id
show ip dhcp snooping
show ip dhcp snooping agent-option

ip dhcp snooping agent-option remote-id

Overview Use this command to specify the Remote ID sub-option of the DHCP Relay Agent Option 82 field. The Remote ID identifies the device that inserted the Option 82 information. If a Remote ID is not specified, the Remote ID sub-option is set to the switch's MAC address.

Use the **no** variant of this command to set the Remote ID to the default, the switch's MAC address.

Syntax `ip dhcp snooping agent-option remote-id <remote-id>`
`no ip dhcp snooping agent-option remote-id`

Parameter	Description
<code><remote-id></code>	An alphanumeric (ASCII) string, 1 to 63 characters in length. If the Remote ID contains spaces, it must be enclosed in double quotes. Wildcards are not allowed.

Default The Remote ID is set to the switch's MAC address by default.

Mode Interface Configuration for a VLAN interface.

Usage The Remote ID sub-option is included in the DHCP Relay Agent Option 82 field of forwarded client DHCP packets:

- DHCP snooping Option 82 information insertion is enabled (**ip dhcp snooping agent-option**; enabled by default), and
- DHCP snooping is enabled on the switch (**service dhcp-snooping**) and on the VLAN to which the port belongs (**ip dhcp snooping**)

Examples To set the Remote ID to `myid` for client DHCP packets received on `vlan1`, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip dhcp snooping agent-option remote-id myid
```

To return the Remote ID format to the default for `vlan1`, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# no ip dhcp snooping agent-option remote-id
```

Related commands **ip dhcp snooping agent-option**
ip dhcp snooping agent-option circuit-id vlantriplet
show ip dhcp snooping
show ip dhcp snooping agent-option

ip dhcp snooping binding

Overview Use this command to manually add a dynamic-like entry (with an expiry time) to the DHCP snooping database. Once added to the database, this entry is treated as a dynamic entry, and is stored in the DHCP snooping database backup file. This command is not stored in the switch's running configuration.

Use the **no** variant of this command to delete a dynamic entry for an IP address from the DHCP snooping database, or to delete all dynamic entries from the database.



CAUTION:

Syntax `ip dhcp snooping binding <ipaddr> [<macaddr>] vlan <vid>
interface <port> expiry <expiry-time>
no ip dhcp snooping binding [<ipaddr>]`

Parameter	Description
<ipaddr>	Client's IP address.
<macaddr>	Client's MAC address in HHHH.HHHH.HHHH format.
<vid>	The VLAN ID for the entry, in the range 1 to 4094.
<port>	The port the client is connected to. The port can be a switch port, or a static or dynamic link aggregation (channel group).
<expiry-time>	The expiry time for the entry, in the range 5 to 2147483647 seconds.

Mode Privileged Exec

Usage notes Note that dynamic entries can also be deleted from the DHCP snooping database by using the [clear ip dhcp snooping binding](#).

To add or remove static entries from the database, use the [ip source binding](#).

Example To restore an entry in the DHCP snooping database for a DHCP client with the IP address 192.168.1.2, MAC address 0001.0002.0003, on port1.0.6 of vlan6, and with an expiry time of 1 hour, use the commands:

```
awplus# ip dhcp snooping binding 192.168.1.2 0001.0002.0003 vlan  
6 interface port1.0.6 expiry 3600
```

Related commands **clear ip dhcp snooping binding**
ip source binding
show ip dhcp snooping binding

ip dhcp snooping database

Overview Use this command to set the location of the file to which the dynamic entries in the DHCP snooping database are written. This file provides a backup for the DHCP snooping database.

Use the **no** variant of this command to set the database location back to the default, **nvs**.

Syntax `ip dhcp snooping database {nvs|flash|usb}`
`no ip dhcp snooping database`

Parameter	Description
nvs	The switch checks the database and writes the file to non-volatile storage (NVS) on the switch at 2 second intervals if it has changed.
flash	The switch checks the database and writes the file to Flash memory on the switch at 60 second intervals if it has changed.
usb	The switch checks the database and writes the file to a USB storage device installed in the switch at 2 second intervals if it has changed.

Default nvs

Mode Global Configuration

Usage notes If the location of the backup file is changed by using this command, a new file is created in the new location, and the old version of the file remains in the old location. This can be removed if necessary (hidden file: **.dhcp.dsn.gz**).

Example To set the location of the DHCP snooping database to Flash memory, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp snooping database flash
```

Related commands [show ip dhcp snooping](#)

ip dhcp snooping delete-by-client

Overview Use this command to set the switch to remove a dynamic entry from the DHCP snooping database when it receives a valid DHCP release message with matching IP address, VLAN ID, and client hardware address on an untrusted port, and to discard release messages that do not match an entry in the database.

Use the **no** variant of this command to set the switch to forward DHCP release messages received on untrusted ports without removing any entries from the database.

Syntax `ip dhcp snooping delete-by-client`
`no ip dhcp snooping delete-by-client`

Default Enabled: by default, DHCP lease entries are deleted from the DHCP snooping database when matching DHCP release messages are received.

Mode Global Configuration

Usage DHCP clients send a release message when they no longer wish to use the IP address they have been allocated by a DHCP server. Use this command to enable DHCP snooping to use the information in these messages to remove entries from its database immediately. Use the **no** variant of this command to ignore these release messages. Lease entries corresponding to ignored DHCP release messages eventually time out when the lease expires.

Examples To set the switch to delete DHCP snooping lease entries from the DHCP snooping database when a matching release message is received, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp snooping delete-by-client
```

To set the switch to forward and ignore the content of any DHCP release messages it receives, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp snooping delete-by-client
```

Related commands [show ip dhcp snooping](#)

ip dhcp snooping delete-by-linkdown

Overview Use this command to set the switch to remove a dynamic entry from the DHCP snooping database when its port goes down. If the port is part of an aggregated link, the entries in the database are only deleted if all the ports in the aggregated link are down.

Use the **no** variant of this command to set the switch not to delete entries when ports go down.

Syntax `ip dhcp snooping delete-by-linkdown`
`no ip dhcp snooping delete-by-linkdown`

Default Disabled: by default DHCP Snooping bindings are not deleted when an interface goes down.

Mode Global Configuration

Examples To set the switch to delete DHCP snooping lease entries from the DHCP snooping database when links go down, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp snooping delete-by-linkdown
```

To set the switch not to delete DHCP snooping lease entries from the DHCP snooping database when links go down, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp snooping delete-by-linkdown
```

Related commands [show ip dhcp snooping](#)

ip dhcp snooping disable-l2-flooding

Overview Use this command to disable Layer 2 flooding of DHCP packets on the specified VLANs. These should be VLANs that you have **not** enabled DHCP snooping on.

You need to do this if you have enabled DHCP snooping on a subset of your VLANs and you are using Q-in-Q (VLAN stacking or VLAN double-tagging). Otherwise, the switch may forward two copies of some DHCP packets on the non-snooping VLANs, with one copy being single-tagged instead of double-tagged.

Use the **no** variant of this command to enable Layer 2 flooding of DHCP packets again.

Syntax `ip dhcp snooping disable-l2-flooding`
`no ip dhcp snooping disable-l2-flooding`

Default The **no** variant, so Layer 2 flooding of DHCP packets is enabled

Mode Interface Configuration for a VLAN interface.

Example To disable Layer 2 flooding on VLANs 10-20, which DHCP snooping is **not** enabled on, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10-vlan20
awplus(config-if)# ip dhcp snooping disable-l2-flooding
```

Related commands [service dhcp-snooping](#)

ip dhcp snooping max-bindings

Overview Use this command to set the maximum number of DHCP lease entries that can be stored in the DHCP snooping database for each of the ports. Once this limit has been reached, no further DHCP lease allocations made to devices on the port are stored in the database.

Use the **no** variant of this command to reset the maximum to the default, 1.

Syntax `ip dhcp snooping max-bindings <0-520>`
`no ip dhcp snooping max-bindings`

Parameter	Description
<0-520>	The maximum number of bindings that will be stored for the port in the DHCP snooping binding database. If 0 is specified, no entries will be stored in the database for the port.

Default The default for maximum bindings is 1.

Mode Interface Configuration (port)

Usage notes The maximum number of leases cannot be changed for a port while there are DHCP snooping Access Control Lists (ACL) associated with the port. Before using this command, remove any DHCP snooping ACLs associated with the ports. To display ACLs used for DHCP snooping, use the [show ip dhcp snooping acl](#).

In general, the default (1) will work well on an edge port with a single directly connected DHCP client. If the port is on an aggregation switch that is connected to an edge switch with multiple DHCP clients connected through it, then use this command to increase the number of lease entries for the port.

If there are multiple VLANs configured on the port, the limit is shared between all the VLANs on this port. For example, the default only allows one lease to be stored for one VLAN. To allow connectivity for the other VLANs, use this command to increase the number of lease entries for the port.

Example To set the maximum number of bindings to be stored in the DHCP snooping database to 10 per port for ports 1.0.1 to 1.0.6, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.6
awplus(config-if)# ip dhcp snooping max-bindings 10
```

Related **access-group**
commands **show ip dhcp snooping acl**
show ip dhcp snooping interface

ip dhcp snooping subscriber-id

Overview Use this command to set a Subscriber ID for the ports.

Use the **no** variant of this command to remove Subscriber IDs from the ports.

Syntax ip dhcp snooping subscriber-id [*<sub-id>*]
no ip dhcp snooping subscriber-id

Parameter	Description
<i><sub-id></i>	The Subscriber ID; an alphanumeric (ASCII) string 1 to 50 characters in length. If the Subscriber ID contains spaces, it must be enclosed in double quotes. Wildcards are not allowed.

Default No Subscriber ID.

Mode Interface Configuration (port)

Usage notes The Subscriber ID sub-option is included in the DHCP Relay Agent Option 82 field of client DHCP packets forwarded from a port if:

- a Subscriber ID is specified for the port using this command, and
- DHCP snooping Option 82 information insertion is enabled (**ip dhcp snooping agent-option**; enabled by default), and
- DHCP snooping is enabled on the switch (**service dhcp-snooping**) and on the VLAN to which the port belongs (**ip dhcp snooping**)

Examples To set the Subscriber ID for port 1.0.3 to **room_534**, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# ip dhcp snooping subscriber-id room_534
```

To remove the Subscriber ID from port 1.0.3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.3
awplus(config-if)# no ip dhcp snooping subscriber-id
```

Related commands **ip dhcp snooping agent-option**
show ip dhcp snooping interface

ip dhcp snooping trust

Overview Use this command to set the ports to be DHCP snooping trusted ports.
Use the **no** variant of this command to return the ports to their default as untrusted ports.

Syntax ip dhcp snooping trust
no ip dhcp snooping trust

Default All ports are untrusted by default.

Mode Interface Configuration (port)

Usage notes Typically, ports connecting the switch to trusted elements in the network (towards the core) are set as trusted ports, while ports connecting untrusted network elements are set as untrusted. Configure ports connected to DHCP servers as trusted ports.

Example To set switch ports 1.0.1 and 1.0.2 to be trusted ports, use the commands:
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.2
awplus(config-if)# ip dhcp snooping trust

Related commands [show ip dhcp snooping interface](#)

ip dhcp snooping verify mac-address

Overview Use this command to verify that the source MAC address and client hardware address match in DHCP packets received on untrusted ports.
Use the **no** variant of this command to disable MAC address verification.

Syntax ip dhcp snooping verify mac-address
no ip dhcp snooping verify mac-address

Default Enabled—source MAC addresses are verified by default.

Mode Global Configuration

Usage When MAC address verification is enabled, the switch treats DHCP packets with source MAC address and client hardware address that do not match as DHCP snooping violations: it drops them and applies any other violation action specified by the **ip dhcp snooping violation**. To bring the port back up again after any issues have been resolved, use the **shutdown**.

Example To disable MAC address verification on the switch, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp snooping verify mac-address
```

Related commands **ip dhcp snooping violation**
show ip dhcp snooping
show ip dhcp snooping statistics

ip dhcp snooping violation

Overview Use this command to specify the action the switch will take when it detects a DHCP snooping violation by a DHCP packet on the ports.

Use the **no** variant of this command to disable the specified violation actions, or all violation actions.

Syntax `ip dhcp snooping violation {log|trap|link-down} ...`
`no ip dhcp snooping violation [{log|trap|link-down} ...]`

Parameter	Description
log	Generate a log message. To display these messages, use the show log . Default: disabled.
trap	Generate an SNMP notification (trap). To send SNMP notifications, SNMP must also be configured, and DHCP snooping notifications must be enabled using the snmp-server enable trap . Notifications are limited to one per second and to one per source MAC and violation reason. Default: disabled.
link-down	Set the port status to link-down. Default: disabled.

Default By default, DHCP packets that violate DHCP snooping are dropped, but no other violation action is taken.

Mode Interface Configuration (port)

Usage notes If a port has been shut down in response to a violation, to bring it back up again after any issues have been resolved, use the [shutdown](#).

IP packets dropped by DHCP snooping filters do not result in other DHCP snooping violation actions.

Example To set the switch to send an SNMP notification and set the link status to link-down if it detects a DHCP snooping violation on switch ports 1.0.1 to 1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap dhcpsnooping
awplus(config)# interface port1.0.1-port1.0.4
awplus(config-if)# ip dhcp snooping violation trap link-down
```

Related commands **show ip dhcp snooping interface**
show log
snmp-server enable trap

ip source binding

Overview Use this command to add or replace a static entry in the DHCP snooping database.

Use the **no** variant of this command to delete the specified static entry or all static entries from the database.

Syntax `ip source binding <ipaddr> [<macaddr>] vlan <vid> interface <port>`
`no ip source binding [<ipaddr>]`

Parameter	Description
<ipaddr>	Client's IP address. If there is already an entry in the DHCP snooping database for this IP address, then this command replaces it with the new entry.
<macaddr>	Client's MAC address in HHHH.HHHH.HHHH format.
<vid>	The VLAN ID associated with the entry.
<port>	The port the client is connected to.

Mode Global Configuration

Usage notes This command removes static entries from the database.

To remove dynamic entries, use the **clear ip dhcp snooping binding** or the **no** variant of the **ip dhcp snooping binding**.

Examples To add a static entry to the DHCP snooping database for a client with the IP address 192.168.1.2, MAC address 0001.0002.0003, on port1.0.6 of vlan6, use the command:

```
awplus# configure terminal
awplus(config)# ip source binding 192.168.1.2 0001.0002.0003
vlan 6 interface port1.0.6
```

To remove the static entry for IP address 192.168.1.2 from the database, use the commands:

```
awplus# configure terminal
awplus(config)# no ip source binding 192.168.1.2
```

To remove all static entries from the database, use the commands:

```
awplus# configure terminal
awplus(config)# no ip source binding
```

Related commands

- clear ip dhcp snooping binding**
- ip dhcp snooping binding**
- show ip dhcp snooping binding**
- show ip source binding**

service dhcp-snooping

Overview Use the **service dhcp-snooping** command to enable the DHCP snooping service globally on the switch. As well, you need to enable it on the desired VLANs, using the **ip dhcp snooping** command. The switch creates a global DHCP snooping Access Control list (ACL) the first time you use the **ip dhcp snooping** command, to send DHCP packets to the CPU for processing. Note that the switch will forward all DHCP traffic to the CPU, no matter what VLAN it belongs to.

Alternatively, you can use the **service dhcp-snooping per-vlan** command instead of the **service dhcp-snooping** command. This option only creates ACLs for the VLANs that you configure with the **ip dhcp snooping** command. This limits the amount of DHCP traffic that is forwarded to the CPU. However, using this option creates 2 ACLs for each VLAN that DHCP snooping is enabled on, so it is most suitable if you have a small number of VLANs. Use the **show platform classifier statistics utilization brief** command to see the number of ACLs available for your switch.

Use the **no** variant of this command to disable the DHCP snooping service on the switch.

Syntax service dhcp-snooping
service dhcp-snooping per-vlan
no service dhcp-snooping

Parameter	Description
per-vlan	This optional parameter only enables DHCP snooping for the VLANs configured using the command ip dhcp snooping . Using this option creates ACL entries for only the VLANs that DHCP snooping is enabled on. This limits the DHCP traffic forwarded to the CPU.

Default Disabled

Mode Global Configuration

Usage notes **Enabling DHCP snooping**

For DHCP snooping to operate on a VLAN, you must:

- enable the service on the switch by using this command, and
- enable DHCP snooping on the particular VLAN by using the **ip dhcp snooping** command, and
- if there is an external DHCP server, configure the port connected to the server as a trusted port, by using the **ip dhcp snooping trust** command

Disabling DHCP snooping

Use **no service dhcp-snooping** to disable DHCP snooping.

Disabling DHCP snooping removes all DHCP snooping configuration from the running configuration, except for:

- any DHCP snooping maximum bindings settings (**ip dhcp snooping max-bindings**), and
- any additional DHCP snooping-based ACLs you have created for filtering on untrusted ports.

You must remove any such additional DHCP snooping-based ACLs, using the **no access-group** command. This is because these ACLs block all traffic except for traffic that matches DHCP snooping entries. Once you have disabled DHCP snooping, these ACLs will block all traffic. Note that if you disable DHCP snooping on particular VLANs (using the **no ip dhcp snooping** command), you need to make sure you remove any such additional ACLs that apply to those VLANs.

If you re-enable the service, the switch repopulates the DHCP snooping database from the dynamic lease entries in the database backup file (see the **ip dhcp snooping database** command). It also updates the lease expiry times.

Per-VLAN DHCP snooping

This mode only enables DHCP snooping for the VLANs configured using the command **ip dhcp snooping**. It minimizes the amount of DHCP traffic forwarded to the CPU. However, it creates 2 ACL entries for each VLAN that DHCP snooping is enabled on, so it is most suitable if you have a small number of VLANs. Use the **show platform classifier statistics utilization brief** command to see the number of ACLs available for your switch.

If you use this mode and you are also using Q-in-Q (VLAN stacking or VLAN double-tagging), then you need to disable Layer 2 flooding on VLANs that do not have DHCP snooping configured. Otherwise, the switch may forward two copies of some DHCP packets on the non-snooping VLANs, with one copy being single-tagged instead of double-tagged. To turn off L2 flooding, use the **ip dhcp snooping disable-l2-flooding** command.

Examples To enable the DHCP snooping service on only the VLANs that have DHCP snooping enabled, use the commands:

```
awplus# configure terminal
awplus(config)# service dhcp-snooping
```

To disable the DHCP snooping service on the switch, use the commands:

```
awplus# configure terminal
awplus(config)# no service dhcp-snooping
```

Related commands

- access-group**
- ip dhcp snooping**
- ip dhcp snooping database**
- ip dhcp snooping disable-l2-flooding**
- ip dhcp snooping max-bindings**
- show ip dhcp snooping**

Command changes Version 5.4.9-2.1: **per -vlan** parameter added for SBx8100, x530, and x320 series.

Version 5.4.9-2.1: **per -vlan** parameter added for IE510, IE340, IE300, SBx908 GEN2, x950, x930, and x510 series.

show arp security

Overview Use this command to display ARP security configuration.

Syntax show arp security

Mode User Exec and Privileged Exec

Example To display ARP security configuration on the switch use the command:

```
awplus# show arp security
```

Example output from the show arp security command

```
awplus# show arp security
ARP Security Information:
  Total VLANs enabled ..... 2
  Total VLANs disabled ..... 11
  vlan1 ..... Disabled
  vlan2 ..... Disabled
  vlan3 ..... Disabled
  vlan4 ..... Disabled
  vlan5 ..... Disabled
  vlan100 ..... Disabled
  vlan101 ..... Disabled
  vlan102 ..... Disabled
  vlan103 ..... Disabled
  vlan104 ..... Disabled
  vlan105 ..... Enabled
  vlan1000 ..... Disabled
  vlan1001 ..... Enabled
```

Parameters in the output from the show arp security command

Parameter	Description
Total VLANs enabled	The number of VLANs that have ARP security enabled.
Total VLANs disabled	The number of VLANs that have ARP security disabled.

Related commands

- [arp security](#)
- [show arp security interface](#)
- [show arp security statistics](#)

show arp security interface

Overview Use this command to display ARP security configuration for the specified ports or all ports.

Syntax show arp security interface [*<port-list>*]

Parameter	Description
<i><port-list></i>	The ports to display ARP security information about. The port list can include switch ports, and static or dynamic aggregated links.

Mode User Exec and Privileged Exec

Example To display ARP security configuration for ports, use the command:

```
awplus# show arp security interface
```

Example output from the show arp security interface command

```
awplus#show arp security interface

Arp Security Port Status and Configuration:

  Port: Provisioned ports marked with brackets, e.g. (portx.y.z)
KEY:   LG = Log
       TR = Trap
       LD = Link down

Port          Action
-----
port1.0.1     -- -- --
port1.0.2     -- -- --
port1.0.3     LG TR LD
port1.0.4     LG -- --
port1.0.5     LG -- --
port1.0.6     LG TR --
port1.0.7     LG -- LD
...
```

Parameters in the output from the show arp security interface command

Parameter	Description
Action	The action the switch takes when it detects an ARP security violation on the port.
Port	The port. Parentheses indicate that ports are configured for provisioning.
LG, Log	Generate a log message
TR, Trap	Generate an SNMP notification (trap).
LD, Link down	Shut down the link.

Related commands

- [arp security violation](#)
- [show arp security](#)
- [show arp security statistics](#)
- [show log](#)
- [snmp-server enable trap](#)

show arp security statistics

Overview Use this command to display ARP security statistics for the specified ports or all ports.

Syntax show arp security statistics [detail] [interface *<port-list>*]

Parameter	Description
detail	Display detailed statistics.
interface <i><port-list></i>	Display statistics for the specified ports. The port list can include switch ports, and static or dynamic aggregated links

Mode User Exec and Privileged Exec

Example To display the brief statistics for the ARP security, use the command:

```
awplus# show arp security statistics
```

Example output from the show arp security statistics command

```
awplus# show arp security statistics

DHCP Snooping ARP Security Statistics:
  Interface      In      In
                Packets Discards
  -----
  port1.0.3      20      20
  port1.0.4      30      30
  port1.0.12     120      0
```

Parameters in the output from the show arp security statistics command

Parameter	Description
Interface	A port name. Parentheses indicate that ports are configured for provisioning.
In Packets	The total number of incoming ARP packets that are processed by DHCP Snooping ARP Security
In Discards	The total number of ARP packets that are dropped by DHCP Snooping ARP Security.

Example output from the show arp security statistics detail command

```
awplus#show arp security statistics detail

DHCP Snooping ARP Security Statistics:
Interface ..... port1.0.3
  In Packets ..... 20
  In Discards ..... 20
  No Lease ..... 20
  Bad Vlan ..... 0
  Bad Port ..... 0
  Source Ip Not Allocated .... 0
Interface ..... port1.0.4
  In Packets ..... 30
  In Discards ..... 30
  No Lease ..... 30
  Bad Vlan ..... 0
  Bad Port ..... 0
  Source Ip Not Allocated .... 0
Interface ..... port1.0.12
  In Packets ..... 120
  In Discards ..... 0
  No Lease ..... 0
  Bad Vlan ..... 0
  Bad Port ..... 0
  Source Ip Not Allocated .... 0
```

Related commands

- arp security**
- arp security violation**
- clear arp security statistics**
- show arp security**
- show arp security interface**
- show log**

show debugging arp security

Overview Use this command to display the ARP security debugging configuration.

Syntax show debugging arp security

Mode User and Privileged Exec

Example To display the debugging settings for ARP security on the switch, use the command:

```
awplus# show debugging arp security
```

Example output from the show debugging arp security command

```
awplus# show debugging arp security  
ARP Security debugging status:  
  ARP Security debugging is off
```

Related commands [arp security violation](#)
[debug arp security](#)

show debugging ip dhcp snooping

Overview Use this command to display the DHCP snooping debugging configuration.

Syntax show debugging ip dhcp snooping

Mode User Exec and Privileged Exec

Example To display the DHCP snooping debugging configuration, use the command:

```
awplus# show debugging ip dhcp snooping
```

Example output from the show debugging ip dhcp snooping command

```
awplus# show debugging ip dhcp snooping

DHCP snooping debugging status:
  DHCP snooping debugging is off
  DHCP snooping all debugging is off
  DHCP snooping acl debugging is off
  DHCP snooping binding DB debugging is off
  DHCP snooping packet debugging is off
  DHCP snooping detailed packet debugging is off
```

Related commands [debug ip dhcp snooping](#)
[show log](#)

show ip dhcp snooping

Overview Use this command to display DHCP snooping global configuration on the switch.

Syntax show ip dhcp snooping

Mode User Exec and Privileged Exec

Example To display global DHCP snooping configuration on the switch, use the command:

```
awplus# show ip dhcp snooping
```

Example output from show ip dhcp snooping

```
DHCP Snooping Information:
  DHCP Snooping service ..... Enabled

Option 82 insertion ..... Enabled

Option 82 on untrusted ports ..... Not allowed
  Binding delete by client ..... Disabled
  Binding delete by link down ..... Disabled
  Verify MAC address ..... Disabled
  SNMP DHCP Snooping trap ..... Disabled

DHCP Snooping database:
  Database location ..... nvs
  Number of entries in database ..... 2

DHCP Snooping VLANs:
  Total VLANs enabled ..... 1
  Total VLANs disabled ..... 9
  vlan1 ..... Enabled
  vlan2 ..... Disabled
  vlan3 ..... Disabled
  vlan4 ..... Disabled
  vlan5 ..... Disabled
  vlan100 ..... Disabled
  vlan101 ..... Disabled
  vlan105 ..... Disabled
  vlan1000 ..... Disabled
  vlan1001 ..... Disabled
```

Related commands

- [service dhcp-snooping](#)
- [show arp security](#)
- [show ip dhcp snooping acl](#)
- [show ip dhcp snooping agent-option](#)
- [show ip dhcp snooping binding](#)
- [show ip dhcp snooping interface](#)

show ip dhcp snooping acl

Overview Use this command to display information about the Access Control Lists (ACL) that are using the DHCP snooping database.

Syntax `show ip dhcp snooping acl`
`show ip dhcp snooping acl [detail|hardware] [interface`
`<interface-list>]`

Parameter	Description
detail	Detailed DHCP Snooping ACL information.
hardware	DHCP Snooping hardware ACL information.
interface	ACL Interface information.
<interface-list>	The interfaces to display information about.

Mode User Exec and Privileged Exec

Example To display DHCP snooping ACL information, use the command:

```
awplus# show ip dhcp snooping acl
```

Example output from the show ip dhcp snooping acl command

```
awplus#show ip dhcp snooping acl
```

DHCP Snooping Based Filters Summary:

Interface	Bindings	Maximum Bindings	Template Filters	Attached Hardware Filters
port1.0.1	1	520	0	0
port1.0.2	1	3	2	6
port1.0.3	1	2	4	8
port1.0.4	1	2	7	14
port1.0.5	0	2	6	12
port1.0.6	0	1	0	0
port1.0.7	0	1	0	0
port1.0.8	0	1	0	0
port1.0.9	0	1	0	0
port1.0.10	0	1	0	0
port1.0.11	0	1	0	0
port1.0.12	0	1	0	0
(port2.0.1)	0	520	0	0
(port2.0.2)	0	1	0	0

To display DHCP snooping hardware ACL information, use the command:

```
awplus# show ip dhcp snooping acl hardware
```

Example output from the show ip dhcp snooping acl hardware command

```
awplus#show ip dhcp snooping acl hardware
```

DHCP Snooping Based Filters in Hardware:

Interface	Access-list(/ClassMap)	Source IP	Source MAC
port1.0.2	dhcpsn1	10.10.10.10	aaaa.bbbb.cccc
port1.0.2	dhcpsn1	20.20.20.20	0000.aaaa.bbbb
port1.0.2	dhcpsn1	0.0.0.0	0000.0000.0000
port1.0.2	dhcpsn1	0.0.0.0	0000.0000.0000
port1.0.2	dhcpsn1	0.0.0.0	0000.0000.0000
port1.0.2	dhcpsn1	0.0.0.0	0000.0000.0000
port1.0.3	dhcpsn2/cmap1	30.30.30.30	aaaa.bbbb.dddd
port1.0.3	dhcpsn2/cmap1	40.40.40.40	0000.aaaa.cccc
port1.0.3	dhcpsn2/cmap1	50.50.50.50	0000.aaaa.dddd
port1.0.3	dhcpsn2/cmap1	60.60.60.60	0000.aaaa.eeee
port1.0.3	dhcpsn2/cmap1	0.0.0.0	0000.0000.0000
port1.0.3	dhcpsn2/cmap1	0.0.0.0	0000.0000.0000
port1.0.3	dhcpsn2/cmap1	0.0.0.0	0000.0000.0000
port1.0.3	dhcpsn2/cmap1	0.0.0.0	0000.0000.0000
port1.0.4	dhcpsn3/cmap2	70.70.70.70	
port1.0.4	dhcpsn3/cmap2	80.80.80.80	
port1.0.4	dhcpsn2/cmap1	70.70.70.70	
port1.0.4	dhcpsn2/cmap1	80.80.80.80	
port1.0.4	dhcpsn1	70.70.70.70	
port1.0.4	dhcpsn1	80.80.80.80	

To display detailed DHCP snooping ACL information for port 1.0.4, use the command:

```
awplus# show ip dhcp snooping acl detail interface port1.0.4
```

Example output from the show ip dhcp snooping acl detail interface command

```
awplus#show ip dhcp snooping acl detail interface port1.0.4
DHCP Snooping Based Filters Information:
port1.0.4 : Maximum Bindings ..... 2
port1.0.4 : Template filters ..... 7
port1.0.4 : Attached hardware filters .. 14
port1.0.4 : Current bindings ..... 1, 1 free
port1.0.4 : Client 1 ..... 120.120.120.120
port1.0.4 : Templates: cheese (via class-map: cmap2)
port1.0.4 : 10 permit ip dhcpsnooping 100.0.0.0/8
port1.0.4 : Template: dhcpsn2 (via class-map: cmap1)
port1.0.4 : 10 permit ip dhcpsnooping any
port1.0.4 : 20 permit ip dhcpsnooping 10.0.0.0/8
port1.0.4 : 30 permit ip dhcpsnooping 20.0.0.0/8
port1.0.4 : 40 permit ip dhcpsnooping 30.0.0.0/8
port1.0.4 : Template: dhcpsn1 (via access-group)
port1.0.4 : 10 permit ip dhcpsnooping any mac dhcpsnooping abcd.0000.0000 00
00.ffff.ffff
port1.0.4 : 20 permit ip dhcpsnooping any
```

Related commands [access-list hardware \(named hardware ACL\)](#)
[show access-list \(IPv4 Hardware ACLs\)](#)

show ip dhcp snooping agent-option

Overview Use this command to display DHCP snooping Option 82 information for all interfaces, a specific interface or a range of interfaces.

Syntax show ip dhcp snooping agent-option [interface <interface-list>]

Parameter	Description
interface	Specify the interface.
<interface-list>	The name of the interface or interfaces.

Mode User Exec and Privileged Exec

Examples To display DHCP snooping Option 82 information for all interfaces, use the command:

```
awplus# show ip dhcp snooping agent-option
```

To display DHCP snooping Option 82 information for vlan1, use the command:

```
awplus# show ip dhcp snooping agent-option interface vlan1
```

To display DHCP snooping Option 82 information for port1.0.1, use the command:

```
awplus# show ip dhcp snooping agent-option interface port1.0.1
```

Output The following shows typical output.

Example output from the show ip dhcp snooping agent-option command

```
awplus#show ip dhcp snooping agent-option

DHCP Snooping Option 82 Configuration:

Key:      C Id = Circuit Id Format
          R Id = Remote Id
          S Id = Subscriber Id

Option 82 insertion ..... Enabled
Option 82 on untrusted ports ..... Not allowed

-----
vlan1      C Id = vlanifindex
           R Id = Access-Island-01-M1
vlan2      C Id = vlantriplet
           R Id = Access-Island-01-M1
vlan3      C Id = vlantriplet
           R Id = Access-Island-01-M3
vlan4      C Id = vlantriplet
           R Id = 0000.cd28.074c
vlan5      C Id = vlantriplet
           R Id = 0000.cd28.074c
vlan6      C Id = vlantriplet
           R Id = 0000.cd28.074c
port1.0.1  S Id =
port1.0.2  S Id =
port1.0.3  S Id = phone_1
port1.0.4  S Id =
port1.0.5  S Id = PC_1
port1.0.6  S Id = phone_2
```

Related commands

- ip dhcp snooping agent-option**
- ip dhcp snooping agent-option circuit-id vlantriplet**
- ip dhcp snooping agent-option remote-id**
- ip dhcp snooping subscriber-id**
- show ip dhcp snooping**
- show ip dhcp snooping interface**

show ip dhcp snooping binding

Overview Use this command to display all dynamic and static entries in the DHCP snooping binding database.

Syntax show ip dhcp snooping binding

Mode User Exec and Privileged Exec

Example To display entries in the DHCP snooping database, use the command:

```
awplus# show ip dhcp snooping binding
```

Example output from the show ip dhcp snooping binding command

awplus# show ip dhcp snooping binding DHCP Snooping Bindings:						
Client IP Address	MAC Address	Server IP Address	VLAN	Port	Expires (sec)	Type
1.2.3.4	aaaa.bbbb.cccc	--	7	1.0.6	Infinite	Stat
1.2.3.6	any	--	4077	1.0.6	Infinite	Stat
1.3.4.5	any	--	1	sa1	Infinite	Stat
111.111.100.101	0000.0000.0001	111.112.1.1	1	1.0.6	4076	Dyna
111.111.101.108	0000.0000.0108	111.112.1.1	1	1.0.6	4084	Dyna
111.111.101.109	0000.0000.0109	111.112.1.1	1	1.0.6	4085	Dyna
111.211.100.101	--	--	1	1.0.2	2147483325	Dyna
111.211.100.109	00b0.0000.0009	111.112.111.111	1	1.0.2	21	Dyna
111.211.101.101	00b0.0000.0101	111.112.111.111	1	1.0.2	214	Dyna
Total number of bindings in database: 9						

Parameters in the output from the show ip dhcp snooping binding command

Parameter	Description
Client IP Address	The IP address of the DHCP client.
MAC Address	The MAC address of the DHCP client.
Server IP	The IP address of the DHCP server.
VLAN	The VLAN associated with this entry.
Port	The port the client is connected to.
Expires (sec)	The time in seconds until the lease expires.
Type	The source of the entry: - Dyna: dynamically entered by snooping DHCP traffic, configured by the ip dhcp snooping binding command, or loaded from the database backup file. - Stat: added statically by the ip source binding command
Total number of bindings in database	The total number of dynamic and static lease entries in the DHCP snooping database.

Related commands [ip dhcp snooping binding](#)
[ip dhcp snooping max-bindings](#)
[show ip source binding](#)

show ip dhcp snooping interface

Overview Use this command to display information about DHCP snooping configuration and leases for the specified ports, or all ports.

Syntax show ip dhcp snooping interface [*<port-list>*]

Parameter	Description
<i><port-list></i>	The ports to display DHCP snooping configuration information for. If no ports are specified, information for all ports is displayed.

Mode User Exec and Privileged Exec

Example To display DHCP snooping information for all ports, use the command:

```
awplus# show ip dhcp snooping interface
```

Example output from the show ip dhcp snooping interface command

```
awplus#show ip dhcp snooping interface

DHCP Snooping Port Status and Configuration:

Port: Provisioned ports marked with brackets, e.g. (portx.y.z)
Action: LG = Log
        TR = Trap
        LD = Link down
```

Port	Status	Full Leases	Max Leases	Action	Subscriber-ID
port1.0.1	Untrusted	1	1	LG -- --	
port1.0.2	Untrusted	0	50	LG TR LD	Building 1 Level 1
port1.0.3	Untrusted	0	50	LG -- --	
port1.0.4	Untrusted	0	50	LG -- --	Building 1 Level 2
port1.0.5	Untrusted	0	50	LG -- LD	Building 2 Level 1
port1.0.6	Untrusted	0	1	LG -- --	
port1.0.7	Untrusted	0	1	LG -- --	
port1.0.8	Untrusted	0	1	LG -- --	
port1.0.9	Untrusted	0	1	-- TR --	
port1.0.10	Untrusted	0	1	-- -- LD	
port1.0.11	Trusted	0	1	-- -- --	
port1.0.12	Trusted	0	1	-- -- --	

Parameters in the output from the show ip dhcp snooping interface command

Parameter	Description
Port	The port interface name.
Status	The port status: untrusted (default) or trusted.
Full Leases	The number of entries in the DHCP snooping database for the port.
Max Leases	The maximum number of entries that can be stored in the database for the port.
Action	The DHCP snooping violation actions for the port.
Subscriber ID	The subscriber ID for the port. If the subscriber ID is longer than 34 characters, only the first 34 characters are displayed. To display the whole subscriber ID, use the command show running-config dhcp .

Related commands

- [show ip dhcp snooping](#)
- [show ip dhcp snooping statistics](#)
- [show running-config dhcp](#)

show ip dhcp snooping statistics

Overview Use this command to display DHCP snooping statistics.

Syntax `show ip dhcp snooping statistics [detail] [interface <interface-list>]`

Parameter	Description
<code>detail</code>	Display detailed statistics.
<code>interface <interface-list></code>	Display statistics for the specified interfaces. The interface list can contain switch ports, static or dynamic link aggregators (channel groups), or VLANs.

Mode User Exec and Privileged Exec

Example To show the current DHCP snooping statistics for all interfaces, use the command:

```
awplus# show ip dhcp snooping statistics
```

Example output from the show ip dhcp snooping statistics command

```
awplus# show ip dhcp snooping statistics
```

DHCP Snooping Statistics:				
Interface	In BOOTP Packets	In BOOTP Requests	In Replies	In Discards
vlan1	444	386	58	223
port1.0.1	386	386	0	223
port1.0.2	0	0	0	0
port1.0.3	0	0	0	0
port1.0.4	0	0	0	0
port1.0.5	0	0	0	0
port1.0.6	58	0	58	0

Example output from the show ip dhcp snooping statistics detail command

```
awplus# show ip dhcp snooping statistics detail
```

DHCP Snooping Statistics:	
Interface	port1.0.1, All counters 0
Interface	port1.0.2, All counters 0
Interface	port1.0.3, All counters 0
Interface	port1.0.4
In Packets	50
In BOOTP Requests	25
In BOOTP Replies	25
In Discards	1
Invalid BOOTP Information	0
Invalid DHCP ACK	0
Invalid DHCP Release or Decline	0
Invalid IP/UDP Header	0
Max Bindings Exceeded	1
Option 82 Insert Error	0
Option 82 Received Invalid	0
Option 82 Received On Untrusted Port	0
Option 82 Transmit On Untrusted Port	0
Reply Received On Untrusted Port	0
Source MAC/CHADDR Mismatch	0
Static Entry Already Exists	0
Interface	port1.0.5, All counters 0
Interface	port1.0.6, All counters 0

Parameters in the output from the show ip dhcp snooping statistics command

Parameter	Description
Interface	The interface name.
In Packets	The total number of incoming packets that are processed by DHCP Snooping.

Parameter	Description
In BOOTP Requests	The total number of incoming BOOTP Requests.
In BOOTP Replies	The total number of incoming BOOTP Replies.
In Discards	The total number of incoming packets that have been discarded.
Invalid BOOTP Information	Packet contained invalid BOOTP information, such as an invalid BOOTP.OPCode.
Invalid DHCP ACK	A DHCP ACK message was discarded, for reasons such as missing Server Option or Lease Option.
Invalid DHCP Release or Decline	A DHCP Release or Decline message was discarded, for reasons such as mismatch between received interface and current binding information.
Invalid IP/UDP Header	A problem was detected in the IP or UDP header of the packet.
Max Bindings Exceeded	Accepting the packet would cause the maximum number of bindings on a port to be exceeded.
Option 82 Insert Error	An error occurred while trying to insert DHCP Relay Agent Option 82 information.
Option 82 Received Invalid	The DHCP Relay Agent Option 82 information received did not match the information inserted by DHCP Snooping.
Option 82 Received On Untrusted Port	A packet containing DHCP Relay Agent Option 82 information was received on an untrusted port.
Option 82 Transmit On Untrusted Port	A packet containing DHCP Relay Agent Option 82 information was to be sent on an untrusted port.
Reply Received On Untrusted Port	A BOOTP reply was received on an untrusted port.
Source MAC/CHADDR Mismatch	The L2 Source MAC address of the packet did not match the client hardware address field (BOOTP.CHADDR).
Static Entry Already Exists	An entry could not be added as a static entry already exists.

Related commands [clear ip dhcp snooping statistics](#)
[ip dhcp snooping](#)
[ip dhcp snooping violation](#)

show ip source binding

Overview Use this command to display static entries in the DHCP snooping database. These are the entries that have been added by using the **ip source binding**.

Syntax show ip source binding

Mode User Exec and Privileged Exec

Example To display static entries in the DHCP snooping database information, use the command:

```
awplus# show ip source binding
```

Example output from the show ip source binding command

awplus# show ip source binding						
IP Source Bindings:						
Client IP Address	MAC Address	VLAN	Port	Expires (sec)	Type	
-----	-----	-----	-----	-----	-----	
1.1.1.1	0000.1111.2222	1	port1.0.1	Infinite	Static	

Parameters in the output from the show ip source binding command

Parameter	Description
Client IP Address	The IP address of the DHCP client.
MAC Address	The MAC address of the DHCP client.
VLAN	The VLAN ID the packet is received on.
Port	The Layer 2 port name the packet is received on.
Expires (sec)	Always infinite for static bindings, or when the leave time in the DHCP message was 0xffffffff (infinite).
Type	DHCP Snooping binding type: Static

Related commands **ip source binding**
show ip dhcp snooping binding

Part 6: Network Availability

51

VRRP Commands

- Contents**
- **Introduction** on page 2603
 - **advertisement-interval** on page 2604
 - **alternate-checksum-mode** on page 2606
 - **circuit-failover** on page 2607
 - **debug vrrp** on page 2610
 - **debug vrrp events** on page 2611
 - **debug vrrp packet** on page 2612
 - **disable (VRRP)** on page 2613
 - **enable (VRRP)** on page 2614
 - **preempt-mode** on page 2615
 - **priority** on page 2618
 - **router ipv6 vrrp (interface)** on page 2620
 - **router vrrp (interface)** on page 2622
 - **service vrrp** on page 2624
 - **show debugging vrrp** on page 2625
 - **show running-config router ipv6 vrrp** on page 2626
 - **show running-config router vrrp** on page 2627
 - **show vrrp** on page 2628
 - **show vrrp counters** on page 2630
 - **show vrrp ipv6** on page 2633
 - **show vrrp (session)** on page 2634
 - **transition-mode** on page 2635
 - **undebg vrrp** on page 2637
 - **undebg vrrp events** on page 2638
 - **undebg vrrp packet** on page 2639
 - **virtual-ip** on page 2640
 - **virtual-ipv6** on page 2642
 - **vrrp vmac** on page 2644

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure the Virtual Router Redundancy Protocol (VRRP). For more information, see the [VRRP Feature Overview and Configuration Guide](#).
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

advertisement-interval

Overview Use this command to configure the advertisement interval of the virtual router. This is the length of time, in seconds, between each advertisement sent from the master to its backup(s).

IPv6 VRRP advertisements are sent to the multicast address assigned to the VRRP group (ff02:0:0:0:0) and a backup virtual router has to join all multicast groups within this range. VRRP advertisements are sent to a multicast address (ff02::12) every second by default.

Use the **no** variant of this command to remove an advertisement interval of the virtual router, which has been set using the **advertisement-interval** command, and revert to the default advertisement interval of 1 second.

Syntax advertisement-interval [<1-255>|csec <1-4095>]
no advertisement-interval

Parameter	Description
<1-255>	Specifies the advertisement interval in seconds.
csec	Use centiseconds instead of seconds for the advertisement interval.
<1-4095>	Specifies the advertisement interval in centiseconds.

Default The default advertisement interval is 1 second.

Mode Router Configuration

Usage notes Note when using VRRP with VCStacking, ensure the VRRP advertisement-interval is larger than the VCStacking failover time to avoid VCStacking failovers causing VRRP failovers.

See the [VRRP Feature Overview and Configuration Guide](#) for more information about:

- setting the advertisement-interval when configuring VRRP
- using seconds for VRRPv2 host compatibility whenever you use **transition-mode** to upgrade or transition from VRRPv2 to VRRPv3
- VRRPv3 IPv4 configuration details
- VRRPv3 IPv6 configuration details

NOTE:

When using VRRPv3 with VCStacking, ensure that the VRRPv3 advertisement-interval is configured to a longer time than the VCStacking failover time.

If the VRRPv3 advertisement-interval is shorter than the VCStacking failover time, then a VRRPv3 failover will also occur whenever a VCStacking failover occurs. Use seconds not centiseconds to ensure interoperability with VRRPv2.

Examples The example below shows you how to configure the advertisement interval to 6 seconds for the VRRP IPv4 session with VR ID 5 on interface vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# advertisement-interval 6
```

The example below shows you how to reset the advertisement interval to the default of 1 second for the VRRP IPv4 session with VR ID 5 on interface vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# no advertisement-interval
```

The example below shows you how to configure the advertisement interval to 6 seconds for the VRRPv3 IPv6 session with VR ID 5 on interface vlan2:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 5 vlan2
awplus(config-router)# advertisement-interval 6
```

Related commands [router vrrp \(interface\)](#)
[router ipv6 vrrp \(interface\)](#)

Command changes

Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

alternate-checksum-mode

Overview Use this command to enable an alternate checksum mode for VRRPv3 to allow inter-operability with some other vendors' products. The IPv4 checksum for VRRPv3 advertisements will then use a pseudo header in the calculation.

This mode may be required if the other product indicates checksum errors on VRRP packets sent by AlliedWare Plus devices.

Use the **no** variant of this command to disable the alternate checksum mode.

Syntax alternate-checksum-mode
no alternate-checksum-mode

Default Disabled

Mode Router Configuration

Example To turn on the alternate checksum mode for VRRP instance 1 on VLAN1, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 1 vlan1
awplus(config-router)# alternate-checksum-mode
```

To turn off the alternate checksum mode for VRRP instance 1 on VLAN1, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 1 vlan1
awplus(config-router)# no alternate-checksum-mode
```

Related commands [show running-config](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

Version 5.4.7-1.1: command added

circuit-failover

Overview Use this command to enable the VRRP circuit failover feature.

Circuit failover enables the device to take action if the uplink interface goes down, so that the VRRP backup, whose uplink interface is still active, takes over as VRRP master. See the Usage section below and the [VRRP Feature Overview and Configuration Guide](#) for more information.

Use the **no** variant of this command to disable this feature.

Syntax circuit-failover <interface> <1-253>
no circuit-failover [<interface> <1-253>]

Parameter	Description
<interface>	The interface of the router that is monitored. The interface must exist on the router, and is usually an upstream interface. Should the interface go down, then another router that is configured as a backup router in the group takes over as the master. You should configure the circuit failover on an interface other than the active VRRP interface - generally the uplink interface.
<1-253>	Delta value. The value by which virtual routers decrement their priority value during a circuit failover event. Configure this value to be greater than the difference of priorities on the master and backup routers. In the case of failover, this priority delta value is subtracted from the current VR Master Router priority value.

Mode Router Configuration

Usage notes You can use Circuit Failover to monitor up to 32 interfaces per VRRP instance. If a VRRP instance is configured to monitor multiple interfaces, the VRRP priority will be cumulatively decremented by the configured delta for each interface as it goes down.

For example, if VRRP is configured to monitor VLAN2 and VLAN3 with the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip address 192.168.1.1/24
awplus(config-if)# exit
awplus(config)# router vrrp 1 vlan1
awplus(config-router)# virtual-ip 192.168.1.10 backup
awplus(config-router)# priority 100
awplus(config-router)# circuit-failover vlan2 10
awplus(config-router)# circuit-failover vlan3 20
```

then the following examples explain the effect of each VLAN going down:

- If only VLAN2 fails, then the VRRP priority will be decremented by 10. VRRP priority would be adjusted to become 90, because $100 - 10 = 90$.
- If only VLAN3 fails, then the VRRP priority will be decremented by 20. VRRP priority would be adjusted to become 80, because $100 - 20 = 80$.
- If both VLAN2 and VLAN3 fail, then the VRRP priority will be decremented by the cumulative delta values of all monitored interfaces. VRRP priority would therefore be adjusted to become 70, because $100 - 10 - 20 = 70$.

As each monitored interface recovers, the VRRP priority is incremented by the same delta value.

When you configure the delta values of the monitored interfaces, make sure their sum is high enough to ensure that the VRRP priority stays above zero if all the interfaces go down.

Examples To configure circuit failover on an IPv4 VRRP instance on interface VLAN2, so that if VLAN3 goes down, then the priority of VRRP instance 1 is reduced by 30, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 1 vlan2
awplus(config-router)# circuit-failover vlan3 30
```

To remove all configured circuit failovers for the VRRP IPv4 session with VR ID 1 on interface VLAN2, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 1 vlan2
awplus(config-router)# no circuit-failover
```

To configure circuit failover on a VRRPv3 IPv6 session with VR ID 1 on interface VLAN2, so that when interface VLAN3 goes down, the priority of VRRP instance 1 is reduced by 30, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 1 vlan2
awplus(config-router)# circuit-failover vlan3 30
```

To remove all configured circuit failovers for the VRRPv3 IPv6 session with VR ID 1 on interface VLAN2, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 1 vlan2
awplus(config-router)# no circuit-failover
```

Related commands [router vrrp \(interface\)](#)
[router ipv6 vrrp \(interface\)](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

debug vrrp

Overview Use this command to specify debugging options for VRRP. The **all** parameter turns on all the debugging options.

Use the **no** variant of this command to disable this function.

Syntax debug vrrp [all]
no debug vrrp [all]

Mode Privileged Exec and Global Configuration

Usage notes See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 debugging details.

Examples The example below shows you how to enable all debugging for VRRP:

```
awplus# configure terminal
awplus(config)# debug vrrp all
```

The example below shows you how to disable all debugging for VRRP:

```
awplus# configure terminal
awplus(config)# no debug vrrp all
```

Related commands [show debugging vrrp](#)
[undebug vrrp](#)

debug vrrp events

Overview Use this command to specify debugging options for VRRP event troubleshooting.

Use the **no** variant of this command to disable this function.

Syntax debug vrrp events
no debug vrrp events

Mode Privileged Exec and Global Configuration

Usage notes The **debug vrrp events** command enables the display of debug information related to VRRP internal events.

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 debugging details.

Examples The example below shows you how to enable events debugging for VRRP:

```
awplus# configure terminal
awplus(config)# debug vrrp events
```

The example below shows you how to disable events debugging for VRRP:

```
awplus# configure terminal
awplus(config)# no debug vrrp events
```

Related commands [show debugging vrrp](#)
[undebug vrrp events](#)

debug vrrp packet

Overview Use this command to specify debugging options for VRRP packets.
Use the **no** variant of this command to disable this function.

Syntax debug vrrp packet [send|recv]
no debug vrrp packet [send|recv]

Parameter	Description
send	Specifies the debug option set for sent packets.
recv	Specifies the debug option set for received packets.

Mode Privileged Exec and Global Configuration

Usage notes The **debug vrrp packet** command enables the display of debug information related to the sending and receiving of packets.
See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 debugging details.

Examples The example below shows you how to enable received and sent packet debugging for VRRP:

```
awplus# configure terminal
awplus(config)# debug vrrp packet
```

The example below shows you how to enable only received packet debugging for VRRP:

```
awplus# configure terminal
awplus(config)# debug vrrp packet recv
```

The example below shows you how to enable only sent packet debugging for VRRP:

```
awplus# configure terminal
awplus(config)# debug vrrp packet send
```

The example below shows you how to disable packet debugging for VRRP:

```
awplus# configure terminal
awplus(config)# no debug vrrp packet
```

Related commands [show debugging vrrp](#)
[undebug vrrp packet](#)

disable (VRRP)

Overview Use this command to disable a VRRP IPv4 session or a VRRPv3 IPv6 session on the router to stop it participating in virtual routing. Note that when this command is configured then a backup router assumes the role of master router depending on its priority. See the [enable \(VRRP\)](#) command to enable a VRRP IPv4 session or a VRRPv3 IPv6 session on the router.

Syntax disable

Mode Router Configuration

Usage notes See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv4 and IPv6 configuration details.

Examples The example below shows you how to disable the VRRP session for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# disable
```

The example below shows you how to disable the VRRPv3 session for VRRPv3 VR ID 3 on vlan1:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# disable
```

Related commands [enable \(VRRP\)](#)
[router vrrp \(interface\)](#)
[router ipv6 vrrp \(interface\)](#)
[show vrrp](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

enable (VRRP)

Overview Use this command to enable the VRRP session on the router to make it participate in virtual routing. To make changes to the VRRP configuration, first disable the router from participating in virtual routing using the **disable (VRRP)** command.

Syntax enable

Mode Router Configuration

Usage notes You must configure the virtual IP address and define the interface for the VRRP session (using the **virtual-ip** or **virtual-ipv6** and the **router vrrp (interface)** or **router ipv6 vrrp (interface)** commands) before using this command.

See the **VRRP Feature Overview and Configuration Guide** for more information about VRRPv3 IPv4 and IPv6 configuration details.

Examples To enable the VRRP session for VRRP VR ID 5 on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# enable
```

To enable the VRRPv3 session for VRRPv3 VR ID 3 on vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# enable
```

Related commands

- disable (VRRP)**
- router vrrp (interface)**
- router ipv6 vrrp (interface)**
- show vrrp**
- virtual-ip**
- virtual-ipv6**

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

preempt-mode

Overview Use this command to configure preempt mode. If preempt-mode is set to **true**, then the highest priority backup will always be the master when the default master is unavailable.

If preempt-mode is set to **false**, then a higher priority backup will not preempt a lower priority backup who is acting as master.

If preempt-mode is set to **true**, an extra parameter is available called **delay-time**. If the delay-time parameter is used, a VRRP router with a higher priority will wait the configured length of time before it preempts the lower priority VRRP router to take over as master.

Syntax preempt-mode {true|false}[delay-time <0-3600>]

Parameter	Description
true	Preemption is enabled.
false	Preemption is disabled.
delay-time	Enable preempting but delay the preempt by the amount of seconds specified by the delay-time value. Note, a delay-time of 0 means delayed preempting is disabled.

Default The default is **true**.

Mode Router Configuration

Usage notes When the master router fails, the backup routers come online in priority order—highest to lowest. Preempt mode means that a higher priority backup router will take over the master role from a lower priority backup. Preempt mode set to **true** allows a higher priority backup router to relieve a lower priority backup router.

By default, a preemptive scheme is enabled whereby a higher priority backup virtual router that becomes available takes over from the backup virtual router that was previously elected to become the master virtual router.

This preemptive scheme can be disabled using the **preempt-mode false** command. If preemption is disabled on a backup virtual router that is starting up, and this router has a higher priority than the current master, the higher priority backup will not preempt the current master, and the lower priority master will stay in the master role.

See the [VRRP Feature Overview and Configuration Guide](#) for more information about:

- VRRPv3 IPv4 configuration details
- VRRPv3 IPv6 configuration details
- preempt mode and preempt delay-time

Examples The example below shows you how to configure preempt-mode as true for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# preempt-mode true
```

The example below shows you how to configure preempt-mode as false for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# preempt-mode false
```

The example below shows you how to configure preempt-mode as true for VRRPv3 VR ID 3 on vlan1:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# preempt-mode true
```

The example below shows you how to configure preempt-mode as false for VRRPv3 VR ID 3 on vlan1:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# preempt-mode false
```

The example below shows you how to configure delay-time as 20 seconds for VRRPv3 VR ID 5 on vlan5:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 5 vlan5
awplus(config-router)# preempt-mode true delay-time 20
```

Related commands **circuit-failover**
priority

router vrrp (interface)

router ipv6 vrrp (interface)

Command changes

Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

priority

Overview Use this command to configure the VRRP router priority within the virtual router. The highest priority router is Master (unless **preempt-mode** is false).

Use the **no** variant of this command to remove the VRRP router priority within the virtual router, which has been set using the **priority** command.

Syntax `priority <1-255>`
`no priority`

Parameter	Description
<code><1-255></code>	The priority. For the master router, use 255 for this parameter; otherwise use any number from the range <1-254>.

Default On a master router default priority is 255; on a backup router, default priority is 100.

Mode Router Configuration

Usage notes Priority determines the role that each VRRP router plays and what happens if the master virtual router fails. If a VRRP router owns the IP address of the virtual router and the IP address of the interface, then this VRRP router functions as the master virtual router.

Priority also determines whether a VRRP router functions as a backup virtual router and the order of ascendancy to becoming a master virtual router if the master virtual router fails. Configure the priority of each backup virtual router with a value of 1 through 254.

See the **VRRP Feature Overview and Configuration Guide** for more information about VRRPv3 IPv4 and IPv6 configuration details.

Examples The example below shows you how to configure 101 as the priority for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# priority 101
```

The example below shows you how to remove the priority configured for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# no priority
```

The example below shows you how to configure 101 as the priority for VRRPv3 VR ID 3 on vlan1:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# priority 101
```

The example below shows you how to remove the configured priority for VRRPv3 VR ID 3 on vlan1:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# no priority
```

Related commands [circuit-failover](#)
[preempt-mode](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

router ipv6 vrrp (interface)

Overview Use this command to configure VRRPv3 for IPv6 and define the interface that will participate in virtual routing to send and receive advertisement messages. This command allows you to enter the Router Configuration mode.

Use the **no** variant of this command to remove the VRRPv3 for IPv6 configuration. Disable the VRRP session before using the **no** variant of this command.

Syntax router ipv6 vrrp <vrid> <interface>
no router ipv6 vrrp <vrid> <interface>

Parameter	Description
<vrid>	<1-255> The ID of the virtual router VRRPv3 IPv6 session to create.
<interface>	Specify the name of the interface that will participate in the virtual routing. The interface must exist on the router. The interface specified sends and receives VRRPv3 IPv6 advertisement messages.

Mode Global Configuration

Usage notes Use the required <interface> placeholder to define the interface that will participate in virtual routing. This interface is used for two purposes - to send/receive advertisement messages and to forward on behalf of the virtual router when in master state.

NOTE: *Configuring a high number of instances may adversely affect the device's performance, depending on the device CPU, the other protocols it is running, and whether you set the advertisement interval to less than 1 second.*

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv6 configuration details.

Examples The example below shows you how to enable a VRRPv3 session with VR ID 3 on vlan2:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan2
awplus(config-router)# enable
```

The example below shows you how to disable a VRRPv3 session with VR ID 3 on vlan2:

```
awplus(config-router)# disable
awplus(config-router)# exit
awplus(config)# no router ipv6 vrrp 3 vlan2
```

Related commands [advertisement-interval](#)
[circuit-failover](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

router vrrp (interface)

Overview Use this command to configure VRRP IPv4 and define the interface that will participate in virtual routing to send and receive advertisement messages. This command allows you to enter the Router Configuration mode.

Use the **no** variant of this command to remove the VRRP IPv4 configuration. Disable the VRRP session before using the **no** variant of this command.

Syntax router vrrp <vrid> <interface>
no router vrrp <vrid> <interface>

Parameter	Description
<vrid>	<1-255> The ID of the virtual router VRRP IPv4 session to create.
<interface>	Specify the name of the interface that will participate in the virtual routing. The interface must exist on the router. The interface specified sends and receives VRRP IPv4 advertisement messages.

Mode Global Configuration

Usage notes Use the required <interface> placeholder to define the interface that will participate in virtual routing. This interface is used for two purposes - to send/receive advertisement messages and to forward on behalf of the virtual router when in master state.

NOTE: *Configuring a high number of instances may adversely affect the device's performance, depending on the device CPU, the other protocols it is running, and whether you set the advertisement interval to less than 1 second.*

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv4 configuration details.

Examples To enable a VRRP session with VR ID 5 on vlan1, use the commands:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan1
awplus(config-router)# enable
```

To disable a VRRP session with VR ID 5 on vlan1, use the commands:

```
awplus(config-router)# disable
awplus(config-router)# exit
awplus(config)# no router vrrp 5 vlan1
```

Related commands **advertisement-interval**
 circuit-failover
 disable (VRRP)
 enable (VRRP)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

service vrrp

Overview Use this command to enable the VRRP service.

Use the **no** version of the command to disable the VRRP service if you are not using it.

Syntax service vrrp
no service vrrp

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on devices that do not use VRRP. Enable it before configuring VRRP.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Example To enable the VRRP service, use the commands:

```
awplus# configure terminal
awplus(config)# service vrrp
```

To disable the VRRP service, use the commands:

```
awplus# configure terminal
awplus(config)# no service vrrp
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show debugging vrrp

Overview Use this command to display the set VRRP debugging option. Use the terminal monitor command to display output on the console otherwise debug output is in the log file.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

See the **[VRRP Feature Overview and Configuration Guide](#)** for more information about VRRPv3 debugging details.

Syntax show debugging vrrp

Mode User Exec and Privileged Exec

Example The example below shows you how to display VRRP debugging:

```
awplus# show debugging vrrp
```

Related commands

- [debug vrrp](#)**
- [debug vrrp events](#)**
- [debug vrrp packet](#)**

show running-config router ipv6 vrrp

Overview Use this command to show the running configuration for VRRPv3 IPv6. For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv6 configuration details.

Syntax show running-config router vrrp

Mode Privileged Exec, Global Configuration, Line Configuration, and Interface Configuration.

Example The example below shows you how to display the running configuration for VRRPv3 IPv6:

```
awplus# show running-config router ipv6 vrrp
```

Output The following shows typical output.

Example output from the show running-config router ipv6 vrrp command

```
!  
router ipv6 vrrp 3 vlan3  
  virtual-ip fe80::202:b3ff:fed5:983e master  
  circuit-failover vlan3 3  
  advertisement-interval 6  
  preempt-mode false  
!
```

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

show running-config router vrrp

Overview Use this command to show the running configuration for VRRP IPv4.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv4 configuration details.

Syntax show running-config router vrrp

Mode Privileged Exec, Global Configuration, Line Configuration, and Interface Configuration.

Example The example below shows you how to display the running configuration for VRRP IPv4:

```
awplus# show running-config router vrrp
```

Output The following shows typical output.

Example output from the show running-config router vrrp command

```
!  
router vrrp 2 vlan2  
  circuit-failover vlan2 2  
  advertisement-interval 4  
  preempt-mode true  
!
```

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

show vrrp

Overview Use this command to display information about all VRRP IPv4 sessions. This command shows a summary when the optional **brief** parameter is used.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv4 configuration details.

Syntax show vrrp [brief]

Parameter	Description
brief	Brief summary of VRRP sessions.

Mode User Exec and Privileged Exec

Example To display information about all VRRP IPv4 sessions, enter the command:

```
awplus# show vrrp
```

To display brief summary output about VRRP IPv4 sessions, enter the command:

```
awplus# show vrrp brief
```


Output The following shows typical output.

Example output from the show vrrp command

```
awplus#show vrrp
VMAC enabled
Address family IPv4
VRRP Id: 1 on interface: vlan2
State: AdminUp - Master
Virtual IP address: 192.168.1.2 (Not-owner)
Priority is 100
Advertisement interval: 100 centiseconds
Preempt mode: TRUE
Multicast membership on IPv4 interface vlan2: JOINED
Transition mode: FALSE
Accept mode: FALSE
Master address: 192.168.1.3
```

Example output from the show vrrp brief command

```
awplus#show vrrp brief
Interface      Grp  Prio Own  Pre  State      Master addr  Group addr
vlan10         1   200  N    P    Master    192.168.10.4 192.168.10.253
vlan10         2   150  N    P    Backup    192.168.10.4 192.168.10.254
vlan11         3   200  N    P    Master    192.168.11.4 192.168.11.253
vlan11         4   150  N    P    Backup    192.168.11.4 192.168.11.254
```

Related commands [enable \(VRRP\)](#)
[disable \(VRRP\)](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

show vrrp counters

Overview This command displays VRRP SNMP counters on the console, as described in the VRRP MIB and RFC2787, for debugging use while you configure VRRP with commands in this chapter.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show vrrp counters

Mode User Exec and Privileged Exec

Usage notes The output has a section for global counters and a section of counters for each VRRP instance configured. See the descriptions of the counters below the sample output as per RFC2787.

NOTE: Note that the counters displayed with this commands are the same counters as described in RFC 2787, except for the “Monitored Circuit Up” and “Monitored Circuit Down” counters, which are additions beyond the MIB.

Example To display information about VRRP SNMP counters on the console, enter the command:

```
awplus# show vrrp counters
```

Output The following shows typical output.

Example output from the show vrrp counters command

```
awplus#show vrrp counters
VRRP Global Counters:
  Checksum Errors .... 230
  Version Errors ..... 0
  VRID Errors ..... 230

VRRP IPv4 counters for VR 10/vlan10:
  Master Transitions ..... 0
  Received Advertisements ... 0
  Internal Errors ..... 0
  TTL Errors ..... 0
  Received Priority 0 Pkt ... 0
  Sent Priority 0 Pkt ..... 0

  Received Invalid Type ..... 0
  Address List Errors ..... 0
  Packet Length Errors ..... 0
  Monitored Circuit Up ..... 0
  Monitored Circuit Down..... 0

VRRP IPv4 counters for VR 100/vlan100:
  Master Transitions ..... 1
  Received Advertisements ... 1614
  Internal Errors ..... 0
  TTL Errors ..... 0
  Received Priority 0 Pkt ... 0
  Sent Priority 0 Pkt ..... 0

  Received Invalid Type ..... 0
  Address List Errors ..... 0
  Packet Length Errors ..... 0
  Monitored Circuit Up ..... 0
  Monitored Circuit Down..... 2
```

Global counters with descriptions for the show vrrp counters command:

Counter	Description
Checksum Errors	The total number of VRRP packets received with an invalid VRRP checksum value.
Version Errors	The total number of VRRP packets received with an unknown or unsupported version number.
VRID Errors	The total number of VRRP packets received with an invalid VRID for this virtual router.

Per VR counters with descriptions for the show vrrp counters command:

Counter	Description
Master Transitions	The total number of times that this virtual router's state has transitioned to MASTER.

Counter	Description
Received Advertisements	The total number of VRRP advertisements received by this virtual router.
Internal Errors	The total number of VRRP advertisement packets received for which the advertisement interval is different than the one configured for the local virtual router.
TTL Errors	The total number of VRRP packets received by the virtual router with IP TTL (Time-To-Live) not equal to 255.
Received Priority 0 Pkt	The total number of VRRP packets received by the virtual router with a priority of '0'.
Sent Priority 0 Pkt	The total number of VRRP packets sent by the virtual router with a priority of '0'.
Received Invalid Type	The number of VRRP packets received by the virtual router with an invalid value in the 'type' field.
Address List Errors	The total number of packets received for which the address list does not match the locally configured list for the virtual router.
Packet Length Errors	The total number of packets received with a packet length less than the length of the VRRP header.
Monitored Circuit Up	The total number of times the monitored circuit has generated the UP event.
Monitored Circuit Down	The total number of times the monitored circuit has generated the down event.

**Command
changes**

Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

show vrrp ipv6

Overview Use this command to display information about all configured VRRPv3 IPv6 sessions for all interfaces, or all VRRPv3 IPv6 sessions for a given interface with the optional parameter.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv6 configuration details.

Syntax show vrrp ipv6 [*<interface>*]

Parameter	Description
<i><interface></i>	Specify the name of the interface that will participate in the virtual routing. The interface must exist on the router. The interface specified sends and receives VRRPv3 IPv6 advertisement messages.

Mode User Exec and Privileged Exec

Example To display information about all VRRPv3 IPv6 sessions, enter the command:

```
awplus# show vrrp ipv6
```

Output The following shows typical output.

Example output from the show vrrp ipv6 command for a specific interface

```
awplus#show vrrp ipv6 vlan2
VrId <1>
State is Master
Virtual IP is fe80::202:b3ff:fed5:983e (Owner)
Interface is vlan2
Priority is 255
Advertisement interval is 4 sec
Preempt mode is FALSE
```

Related commands [enable \(VRRP\)](#)
[disable \(VRRP\)](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

show vrrp (session)

Overview Use this command to display information for a particular VRRP session.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv4 configuration details.

Syntax show vrrp <vrid> <interface>

Parameter	Description
<vrid>	<1-255> The virtual router ID for which to display information. Session must already exist.
<interface>	The interface to display information about.

Mode User Exec and Privileged Exec

Example To display information about VRRP session 1 configured on vlan2, use the command:

```
awplus# show vrrp 1 vlan2
```

Output The following shows typical output.

Example output from the show vrrp command for a specific interface

```
awplus#show vrrp 1 vlan2
Address family IPv4
VrId <1>
Interface is vlan2
State is Initialize
Virtual IP address is 10.10.11.250 (Not IP owner)
Priority is 100
Advertisement interval is 1 sec
```

In this example, the output shows that a Virtual IP address has been set.

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

transition-mode

Overview Use this command to configure the IPv4 transition mode. Transition mode allows you to upgrade from VRRPv2 to VRRPv3 and gives interoperability between VRRPv2 and VRRPv3.

If transition-mode is set to **true**, then the IPv4 transition mode is enabled and VRRPv2 and VRRPv3 advertisements are sent allowing VRRPv2 and VRRPv3 interoperability. Received VRRPv2 advertisement packets are accepted and processed when transition-mode is true.

If transition-mode is set to **false**, then the IPv4 transition mode is disabled and only VRRPv3 advertisements are sent. Received VRRPv2 advertisement packets are dropped.

Note the **advertisement-interval** should not be configured to less than 1 second when using transition-mode. VRRPv2 can only use advertisements in whole second intervals.

Syntax transition-mode {true|false}

Parameter	Description
true	Transition mode is enabled. This results in VRRPv2 and VRRPv3 IPv4 advertisements being sent. Transition mode is only available on VRRPv3 for interoperability with VRRPv2 while upgrading to VRRPv3.
false	Transition mode is disabled. This stops VRRPv2 IPv4 advertisements being sent. Only VRRPv3 advertisements are sent when disabled. Disable transition-mode after upgrading from VRRPv2 to VRRPv3.

Default The default is **false**.

Mode Router Configuration

Usage notes See the **VRRP Feature Overview and Configuration Guide** for more information about:

- VRRPv3 IPv4 configuration details
- VRRPv3 IPv6 configuration details
- configuring transition mode to upgrade from VRRPv2 to VRRPv3.

Examples The example below shows you how to configure IPv4 transition-mode as true for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# transition-mode true
```

The example below shows you how to configure IPv4 transition-mode as false for VRRP VR ID 5 on vlan2:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# transition-mode false
```

Related commands [router vrrp \(interface\)](#)

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

undebg vrrp

Overview Use this command to disable all VRRP debugging.

Syntax undebg vrrp all

Mode Privileged Exec

Example The example below shows you how to disable all VRRP debugging:

```
awplus# undebg vrrp all
```

Related commands [debug vrrp](#)

undebg vrrp events

Overview Use this command to disable debugging options for VRRP event troubleshooting.

Syntax undebg vrrp events

Mode Privileged Exec

Example The example below shows you how to disable VRRP event debugging:
`awplus# undebg vrrp events`

Related commands [debug vrrp events](#)

undebg vrrp packet

Overview Use this command to disable debugging options for VRRP packets.

Syntax undebg vrrp packet [send|recv]

Parameter	Description
send	Disable the debug option set for sent packets.
recv	Disable the debug option set for received packets.

Mode Privileged Exec

Examples The example below shows you how to disable VRRP sent packet debugging:

```
awplus# undebg vrrp packet send
```

The example below shows you how to disable VRRP received packet debugging:

```
awplus# undebg vrrp packet recv
```

The example below shows you how to disable all VRRP packet debugging:

```
awplus# undebg vrrp packet
```

Related commands [debug vrrp packet](#)

virtual-ip

Overview Use this command to set the virtual IP address for the VRRP session. This is the IP address of the virtual router that end hosts set as their default gateway.

Use the **no** variant of this command to disable this feature.

Syntax `virtual-ip <ip-address> [master|backup|owner]`
`no virtual-ip`

Parameter	Description
<code><ip-address></code>	The virtual IPv4 address of the virtual router, entered in dotted decimal format A.B.C.D.
<code>master</code>	Sets the default state of the VRRP router within the Virtual Router as master . For master, the router must own the Virtual IP address. Specify the owner option before using master option.
<code>backup</code>	Sets the default state of the VRRP router within the Virtual Router as backup .
<code>owner</code>	Sets the IPv6 address of the VRRP router within the Virtual Router as the owner . Specify this before using the master option.

Mode Router Configuration

Usage notes The VRRP master and owner of the virtual IPv4 address for the VRRP session only responds to the packets destined to the virtual IPv6 address. The VRRP master that is not an owner of the virtual IPv4 address for the VRRP session does not respond to the packets destined to the virtual IPv4 address, but forwards packets with a VMAC as the destination address. See the **vrrp vmac** command to enable and disable this feature.

See the **VRRP Feature Overview and Configuration Guide** for more information about VRRPv3 IPv4 configuration details.

Examples The example below shows you how to set the virtual IP address for VRRP VR ID 5 and the router as the VRRP master:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# virtual-ip 192.0.2.30 master
```

The example below shows you how to set the virtual IPv4 address for VRRP VR ID 5 and the router as the VRRP backup:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# virtual-ip 192.0.2.30 backup
```

The example below shows you how to set the virtual IPv4 address for VRRP VR ID 5 and the router as owner of the virtual IPv4 address:

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# virtual-ip 192.0.2.30 owner
```

The example below shows you how to disable the virtual IPv4 address for VRRP VR ID 5

```
awplus# configure terminal
awplus(config)# router vrrp 5 vlan2
awplus(config-router)# no virtual-ip
```

Related commands **router vrrp (interface)**
enable (VRRP)
vrrp vmac

Command changes Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

virtual-ipv6

Overview Use this command to set the virtual IPv6 address for the VRRPv3 session. This is the IPv6 address of the virtual router that end hosts set as their default gateway.

Note that the primary IPv6 address specified is an IPv6 link-local address. See the Usage note below for further information.

Use the **no** variant of this command to disable this feature.

Syntax `virtual-ipv6 <ipv6-address> [master|backup] [primary|secondary]`
`no virtual-ipv6`

Parameter	Description
<code><ipv6-address></code>	The IPv6 address of the virtual router, entered in hexadecimal, in the format X:X::X.X.
<code>master</code>	Sets master to be the default state of the VRRPv3 router within the Virtual Router. For master , we recommend using a Virtual IP address that is not owned by any of the VRRP routers in the same grouping (that share the same VRID).
<code>backup</code>	Sets backup to be the default state of the VRRPv3 router within the Virtual Router.
<code>primary</code>	Sets the specified address as the primary IPv6 address. The primary address must be a link-local IPv6 address.
<code>secondary</code>	Sets the specified address as the secondary IPv6 address. Normally this would be a globally-routable IPv6 address. This enables you to specify a globally-routable address as the default gateway address for all the hosts on an interface.

Mode Router Configuration

Usage notes

The virtual router will reply to ping, telnet, and SSH requests to the virtual IP address. The virtual router will reply even if it does not own the virtual IP address.

The AlliedWare Plus VRRPv3 implementation supports one IPv6 virtual link local address per virtual router ID. Note that in the command examples fe80::1 is an IPv6 link-local address. An IPv6 link-local address is used because IPv6 link-local addresses are used by IPv6 ND (Neighbor Discovery). A host's default route to a router points to the IPv6 link-local address, not a specific global IPv6 address for the router. For the host's traffic to switch over to a backup router, the IPv6 link-local address of the router is used by VRRPv3.

See the [VRRP Feature Overview and Configuration Guide](#) for more information about VRRPv3 IPv6 configuration details.

Examples

The example below shows you how to set the virtual IPv6 address for VRRPv3 VR ID 3 and the router as the VRRPv3 master:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# virtual-ipv6 fe80::1 master
```

The example below shows you how to set the virtual IPv6 address for VRRPv3 VR ID 3 and the router as the VRRPv3 backup:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# virtual-ipv6 fe80::1 backup
```

The example below shows you disable the virtual IPv6 address for VRRPv3 VR ID 3:

```
awplus# configure terminal
awplus(config)# router ipv6 vrrp 3 vlan1
awplus(config-router)# no virtual-ipv6
```

Related commands

router ipv6 vrrp (interface)

enable (VRRP)

vrrp vmac

Command changes

Version 5.5.2-2.1: command added on 10GbE UTM Firewall and AR4000S-Cloud

vrrp vmac

Overview Use this command to enable or disable the VRRP Virtual MAC feature. This feature is used by VRRP to make the hosts use the virtual MAC address as the physical hardware address of their gateway.

A VRRP router master will use the virtual MAC address for any ARP responses associated with the virtual IP address, or any gratuitous ARPs sent on behalf of the virtual IP address.

All VRRP advertisements are sent using this virtual MAC address as the source MAC address.

The virtual MAC address has the form 00:00:5e:00:01:<VRID>, where VRID is the ID of the Virtual Router.

Syntax vrrp vmac {enable|disable}

Mode Global Configuration

Examples To enable Virtual MAC enter:

```
awplus# configure terminal
awplus(config)# vrrp vmac enable
```

To disable Virtual MAC enter:

```
awplus# configure terminal
awplus(config)# vrrp vmac disable
```

Related commands [virtual-ip](#)
[virtual-ipv6](#)

52 Ethernet Protection Switched Ring (EPSRing™) Commands

- Contents**
- **Introduction** on page 2646
 - **debug epsr** on page 2647
 - **epsr** on page 2649
 - **epsr configuration** on page 2651
 - **epsr datavlan** on page 2652
 - **epsr enhancedrecovery enable** on page 2654
 - **epsr flush-type** on page 2655
 - **epsr mode master controlvlan primary port** on page 2657
 - **epsr mode transit controlvlan** on page 2658
 - **epsr priority** on page 2659
 - **epsr state** on page 2660
 - **epsr topology-change** on page 2661
 - **epsr trap** on page 2663
 - **show debugging epsr** on page 2664
 - **service epsr** on page 2665
 - **show epsr** on page 2666
 - **show epsr common segments** on page 2672
 - **show epsr config-check** on page 2673
 - **show epsr <epsr-instance>** on page 2674
 - **show epsr <epsr-instance> counters** on page 2675
 - **show epsr counters** on page 2676
 - **show epsr summary** on page 2677
 - **undebg epsr** on page 2678

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure Ethernet Protection Switched Ring (EPSRing™). For more information, see the [EPSR Feature Overview and Configuration Guide](#).
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

debug epsr

Overview This command enables EPSR debugging.

The **no** variant of this command disables EPSR debugging.

Syntax `debug epsr {info|msg|pkt|state|timer|all}`
`no debug epsr {info|msg|pkt|state|timer|all}`

Parameter	Description
info	Send general EPSR information to the console. Using this parameter with the no debug epsr command will explicitly exclude the above information from being sent to the console.
msg	Send the decoded received and transmitted EPSR packets to the console. Using this parameter with the no debug epsr command will explicitly exclude the above packets from being sent to the console.
pkt	Send the received and transmitted EPSR packets as raw ASCII text to the console. Using this parameter with the no debug epsr command will explicitly exclude the above packets from being sent to the console.
state	Send EPSR state transitions to the console. Using this parameter with the no debug epsr command will explicitly exclude state transitions from being sent to the console.
timer	Send EPSR timer information to the console. Using this parameter with the no debug epsr command will explicitly exclude timer information from being sent to the console.
all	Send all EPSR debugging information to the console. Using this parameter with the no debug epsr command will explicitly exclude any debugging information from being sent to the console.

Mode Privileged Exec and Global Configuration

Examples To enable state transition debugging, use the command:

```
awplus# debug epsr state
```

To disable EPSR packet debugging, use the command:

```
awplus# no debug epsr pkt
```

Related commands [undebug epsr](#)

epsr

Overview This command sets the timer values for an EPSR instance. These are only valid for master nodes.

NOTE: *This command will only run on switches that are capable of running as an EPSR master node. However, even if your switch cannot function as an EPSR master node, you still may need to configure this command on whatever switch is the master within your EPSR network.*

Syntax `epsr <epsr-instance> {hellotime <1-32767>|failovertime <2-65535>
ringflaptime <0-65535>}`
`no epsr <epsr-instance>`



CAUTION: *Using the no variant of this command will remove the specified EPSR instance.*

Parameter	Description
<code><epsr-instance></code>	Name of the EPSR instance.
<code>hellotime <1-32767></code>	The number of seconds between the transmission of health check messages.
<code>failovertime <2-65535></code>	The number of seconds that a master waits for a returning health check message before entering the failed state. The failover time should be greater than twice the hellotime. This is to force the master node to wait until it detects the absence of two sequential healthcheck messages before entering the failed state.
<code>ringflaptime <0-65535></code>	The minimum number of seconds that a master must remain in the failed state.

Mode EPSR Configuration

Examples To set the hellotimer to 5 seconds for the EPSR instance called blue, use the command:

```
awplus(config-epsr)# epsr blue hellotime 5
```

To delete the EPSR instance called blue, use the command:

```
awplus(config-epsr)# no epsr blue
```

Related commands

- epsr mode master controlvlan primary port**
- epsr mode transit controlvlan**
- epsr configuration**
- epsr datavlan**
- epsr state**
- epsr trap**
- show epsr**

epsr configuration

Overview Use this command to enter EPSR Configuration mode so that EPSR can be configured.

Syntax `epsr configuration`

Mode Global Configuration

Example To change to EPSR mode, use the command:
`awplus(config)# epsr configuration`

Related commands `epsr mode master controlvlan primary port`
`epsr`
`show epsr`

epsr datavlan

Overview This command adds a data VLAN or a range of VLAN identifiers to a specified EPSR instance.

The **no** variant of this command removes a data VLAN or data VLAN range from an EPSR instance.

Syntax `epsr <epsr-instance> datavlan {<vlanid>|<vlanid-range>}`
`no epsr <epsr-instance> datavlan {<vlanid>|<vlanid-range>}`

Parameter	Description
<epsr-instance>	Name of the EPSR instance.
datavlan	Adds a data VLAN to be protected by the EPSR instance.
<vlanid>	The VLAN's VID - a number between 1 and 4094 excluding the number selected for the control VLAN.
<vlanid-range>	Specify a range of VLAN identifiers using a hyphen to separate identifiers.

Mode EPSR Configuration

Usage notes We recommend you

- set the EPSR control VLAN to vlan2, using the **epsr mode master controlvlan primary port** and **epsr mode transit controlvlan** commands, then
- set the EPSR data VLAN between to be a value between 3 and 4094, using the **epsr datavlan** command.

Examples To add vlan3 to the EPSR instance called blue, use the command:

```
awplus(config-epsr)# epsr blue datavlan vlan3
```

To add vlan2 and vlan3 to the EPSR instance called blue, use the command:

```
awplus(config-epsr)# epsr blue datavlan vlan2-vlan3
```

To remove vlan3 from the EPSR instance called blue, use the command:

```
awplus(config-epsr)# no epsr blue datavlan vlan3
```

To remove vlan2 and vlan3 from the EPSR instance called blue, use the command:

```
awplus(config-epsr)# no epsr blue datavlan vlan2-vlan3
```


Related commands **epsr mode master controlvlan primary port**
epsr mode transit controlvlan
show epsr

epsr enhancedrecovery enable

Overview This command enables EPSR’s enhanced recovery mode. Enhanced recovery mode enables a ring to apply additional recovery procedures when a ring with more than one break partially mends. For more information, see the [EPSR Feature Overview and Configuration Guide](#).

The **no** variant of this command disables the enhanced recovery mode.

Syntax `epsr <epsr-instance> enhancedrecovery enable`
`no epsr <epsr-instance> enhancedrecovery enable`

Parameter	Description
<code><epsr-instance></code>	Name of the EPSR instance.

Default Default is that enhanced recovery mode disabled.

Mode EPSR Configuration

Example To apply enhanced recovery on the EPSR instance called blue, use the command:

```
awplus(config-epsr)# epsr blue enhancedrecovery enable
```

Related commands [show epsr](#)

epsr flush-type

Overview Use this command to set how EPSR flushes Layer 2 entries when a topology change occurs. It can be configured to flush all Layer 2 entries on its EPSR interfaces or only flush the Layer 2 entries on its EPSR data VLANs.

Use the **no** variant of this command to revert to the default setting.

Syntax `epsr <epsr-name> flush-type {interface|vlan}`
`no epsr <epsr-name> flush-type`

Parameter	Description
<epsr-name>	The name of the EPSR instance to set the flush-type for.
interface	Flush all Layer 2 entries from the EPSR interface on a topology change.
vlan	Flush the Layer 2 entries on the EPSR interface and data VLANs on a topology change.

Default The default flush-type is vlan

Mode EPSR Configuration

Usage notes To flush all entries on the EPSR interface (including non-EPSR data VLANs) the flush-type command must be explicitly configured on the EPSR ring with the **interface** parameter.

Select **interface** as the flush-type to help reduce latency caused during EPSR topology changes. This type of flushing is quicker and less granular than flushing per data vlan, as flushing on a data **vlan** may incur a higher overhead, reducing EPSR responsiveness to ring topology changes.

Interface flushing can be used to optimize EPSR rings with a large number of VLANs. It will however also require relearning on any VLANs that are on an EPSR interface but not part of the EPSR configuration.

Example To configure the behavior of EPSR ring 'red' transit node on topology changes to flush all Layer 2 entries on its EPSR ring interfaces, use the following commands:

```
awplus# configure terminal
awplus(config)# epsr configuration
awplus(config-epsr)# epsr red mode transit controlvlan 10
awplus(config-epsr)# epsr red datavlan 20-29
awplus(config-epsr)# epsr red flush-type interface
awplus(config-epsr)# epsr red state enable
```

Related commands [show epsr](#)

Command changes Version 5.4.9-1.1: command added

epsr mode master controlvlan primary port

Overview This command creates a master EPSR instance.

NOTE: This command will only run on switches that are capable of running as an EPSR master node. However, even if your switch cannot function as an EPSR master node, you still need to configure this command on whatever switch is the master within your EPSR network.

Syntax `epsr <epsr-instance> mode master controlvlan <2-4094> primaryport <port>`

Parameter	Description
<epsr-instance>	Name of the EPSR instance.
mode	Determines the node is acting as a master.
master	Sets switch to be the master node for the named EPSR ring.
controlvlan	The VLAN that will transmit EPSR control frames.
<2-4094>	VLAN id.
primaryport	Primary port for the EPSR instance.
<port>	The primary port. The port may be a switch port (e.g. port1.0.4) or a static channel group (e.g. sa3). It cannot be a dynamic (LACP) channel group.

NOTE: The software allows you to configure more than two ports or static channel groups to the control VLAN within a single switch. However, we advise against this because in certain situations it can produce unpredictable results.

Mode EPSR Configuration

Example To create a master EPSR instance called blue with vlan2 as the control VLAN and port1.0.1 as the primary port, use the command:

```
awplus(config-epsr)# epsr blue mode master controlvlan vlan2  
primaryport port1.0.1
```

Related commands [epsr mode transit controlvlan](#)
[show epsr](#)

epsr mode transit controlvlan

Overview This command creates a transit EPSR instance.

Syntax `epsr <epsr-instance> mode transit controlvlan <2-4094>`

Parameter	Description
<epsr-instance>	Name of the EPSR instance.
mode	Determines the node is acting as a transit node.
transit	Sets switch to be the transit node for the named EPSR ring.
controlvlan	The VLAN that will transmit EPSR control frames.
<2-4094>	VLAN id.

NOTE: The software allows you to configure more than two ports or static channel groups to the control VLAN within a single switch. However, we advise against this because in certain situations it can produce unpredictable results.

If the control VLAN contains more than two ports (or static channels) an algorithm selects the two ports or channels with the lowest number to be the ring ports. However if the switch has only one channel group is defined to the control vlan, EPSR will not operate on the secondary port.

EPSR does not support Dynamic link aggregation (LACP).

Mode EPSR Configuration

Example To create a transit EPSR instance called `blue` with `vlan2` as the control VLAN, use the command:

```
awplus(config-epsr)# epsr blue mode transit controlvlan vlan2
```

Related commands

- [epsr mode master controlvlan primary port](#)
- [epsr mode transit controlvlan](#)
- [show epsr](#)

epsr priority

Overview This command sets the priority of an EPSR instance on an EPSR node. Priority is used to prevent “superloops” forming under fault conditions with particular ring configurations. Setting a node to have a priority greater than one turns on **superloop protection**.

The **no** variant of this command returns the priority of the EPSR instance back to its default value of 0, which also disables EPSR Superloop prevention.

Syntax `epsr <epsr-instance> priority <0-127>`
`no <epsr-instance> priority`

Parameter	Description
<code><epsr-instance></code>	Name of the EPSR instance.
<code>priority</code>	The priority of the ring instance selected by the <code>epsr-name</code> parameter.
<code><0-127></code>	The priority to be applied (0 is the lowest priority and represents no superloop protection).

Default The default priority of an EPSR instance on an EPSR node is 0. The negated form of this command resets the priority of an EPSR instance on an EPSR node to the default value.

Mode EPSR Configuration

Example To set the priority of the EPSR instance called ‘blue’ to the highest priority (127), use the command:

```
awplus(config-epsr)# epsr blue priority 127
```

To reset the priority of the EPSR instance called ‘blue’ to the default (0), use the command:

```
awplus(config-epsr)# no epsr blue priority
```

Related commands [epsr configuration](#)

epsr state

Overview This command enables or disables an EPSR instance.

Syntax `epsr <epsr-instance> state {enabled|disabled}`

Parameter	Description
<code><epsr-instance></code>	The name of the EPSR instance.
<code>state</code>	The operational state of the ring.
<code>enabled</code>	EPSR instance is enabled.
<code>disabled</code>	EPSR instance is disabled.

Mode EPSR Configuration

Usage notes In a super-loop protection scenario, if you have:

- a device on the common segment acting as the master node for multiple EPSR rings,
- and you disable the rings and later re-enable them (e.g., when doing EPSR configuration changes),
- then you must re-enable the ring with the highest EPSR SLP priority **last**.

If you do not re-enable the rings in that order, the primary port may end up permanently in a blocking state. If the primary port does end up in a permanent blocking state, recover by disabling and re-enabling the EPSR ring that has the highest priority.

Example To enable the EPSR instance called 'blue', use the command:

```
awplus(config-epsr)# epsr blue state enabled
```

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)

epsr topology-change

Overview Use this command to allow the given EPSR instance to accept notifications from other topology protocols, namely G.8032, for Topology Change Notifications (TCN).

Use the **no** variant of this command to return the EPSR instance to where it does not accept TCNs from the other specified protocol, and as a result does not send out a “flush FDB” message.

Syntax `epsr <epsr-name> topology-change g8032`
`no epsr <epsr-name> topology-change g8032`

Parameter	Description
<code><epsr-name></code>	The name of the EPSR instance for which the topology-change applies to.
<code>topology-change</code>	The topology-change value to be set for the instance.
<code>g8032</code>	Specify that G.8032 is the other protocol that the topology-change notifications are allowed to be accepted from in order to send “flush FDB” messages to other EPSR nodes in the ring.

Default The default value is no notifications are accepted and in turn no “flush FDB” messages are sent.

Mode EPSR Configuration

Usage notes The purpose of this command is to allow EPSR to accept notifications from other topology protocols, namely G.8032, about Topology Change Notifications (TCN). Once EPSR accepts the TCN, it will in turn notify the other nodes on the EPSR ring to perform an FDB flush.

Example To configure an EPSR instance named “red” to accept G.8032 TCNs, use the following command:

```
awplus(config-epsr)# epsr red topology-change g8032
```

To configure an EPSR instance named “red” to no longer accept G.8032 TCNs, use the following command:

```
awplus(config-epsr)# no epsr red topology-change g8032
```

Related commands [show epsr](#)
[show g8032 erp-instance](#)

Command changes Version 5.4.7-1.1: command added

epsr trap

Overview This command enables SNMP traps for an EPSR instance. The traps will be sent when the EPSR instance changes state.

The **no** variant of this command disables SNMP traps for an EPSR instance. The traps will no longer be sent when the EPSR instance changes state.

Syntax `epsr <epsr-instance> trap`
`no epsr <epsr-instance> trap`

Parameter	Description
<code><epsr-instance></code>	Name of the EPSR instance.
<code>trap</code>	SNMP trap for the EPSR instance.

Mode EPSR Configuration

Example To enable traps for the EPSR instance called `blue`, use the command:

```
awplus(config-epsr)# epsr blue trap
```

To disable traps for the EPSR instance called `blue`, use the command:

```
awplus(config-epsr)# no epsr blue trap
```

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)
[show epsr](#)

show debugging epsr

Overview This command shows the debugging modes enabled for EPSR.

Syntax show debugging epsr

Mode User Exec and Privileged Exec

Example To show the enabled debugging modes, use the command:

```
awplus# show debugging epsr
```

Related commands [debug epsr](#)

service epsr

Overview Use this command to enable the EPSR service.

Use the **no** version of the command to disable the unused EPSR service.

Syntax service epsr
no service epsr

Default Disabled

Mode Global Configuration

Usage notes This service is disabled by default, to reduce memory use on switches that are not using EPSR. Enable it before configuring EPSR.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Examples To enable the EPSR service, use the commands:

```
awplus# configure terminal
awplus(config)# service epsr
```

To disable the EPSR service, use the commands:

```
awplus# configure terminal
awplus(config)# no service epsr
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: command added

show epsr

Overview This command displays information about all EPSR instances.

Syntax show epsr

Mode User Exec and Privileged Exec

Example To show the current settings of all EPSR instances, use the command:

```
awplus# show epsr
```

Output: non-superloop topology The following examples show the output display for a non-superloop topology network.

Example output from the show epsr command run on a transit node

```
EPSR Information
-----
Name ..... test2
Mode ..... Transit
Status ..... Enabled
State ..... Links-Up
Control Vlan ..... 2
Data VLAN(s) ..... 10
Interface Mode ..... Ports Only
First Port ..... port1.0.1
First Port Status ..... Down
First Port Direction ..... Unknown
Second Port ..... port1.0.2
Second Port Status ..... Down
Second Port Direction ..... Unknown
Trap ..... Enabled
Master Node ..... Unknown
Enhanced Recovery ..... Disabled
-----
```

Example output from the show epsr command run on a master node

```
EPSR Information
-----
Name ..... test4
Mode ..... Master
Status ..... Enabled
State ..... Complete
Control Vlan ..... 4
Data VLAN(s) ..... 20
Interface Mode ..... Ports Only
Primary Port ..... port1.0.3
Primary Port Status ..... Forwarding
Secondary Port ..... port1.0.4
Secondary Port Status ..... Forwarding
Hello Time ..... 1 s
Failover Time ..... 2 s
Ring Flap Time ..... 0 s
Trap ..... Enabled
Enhanced Recovery ..... Disabled
-----
```

NOTE: The above output is only displayed on an EPSR master.

Output: The following examples show the output display for superloop topology network.

Example output from the show epsr command run on a Master Node

```
-----
EPSR Information
-----
Name ..... test4
Mode ..... Master
Status ..... Enabled
State ..... Complete
Control Vlan ..... 4
Data VLAN(s) ..... 20
Interface Mode ..... Ports Only
Primary Port ..... port1.0.3
  Status ..... Forwarding (logically blocking)
  Is On Common Segment ..... No
  Blocking Control ..... Physical
Secondary Port ..... port1.0.4
  Status ..... Blocked
  Is On Common Segment ..... No
  Blocking Control ..... Physical
Hello Time ..... 1 s
Failover Time ..... 2 s
Ring Flap Time ..... 0 s
Trap ..... Enabled
Enhanced Recovery ..... Disabled
SLP Priority ..... 12
-----
```

NOTE: The above output is only displayed on an EPSR master.

Example output from the show epsr command run on a Transit Node

```
-----
EPSR Information
-----
Name ..... test4
Mode ..... Transit
Status ..... Enabled
State ..... Complete
Control Vlan ..... 4
Data VLAN(s) ..... 20
Interface Mode ..... Ports Only
Primary Port ..... port1.0.3
  Status ..... Forwarding (logically blocking)
  Is On Common Segment ..... No
  Blocking Control ..... Physical
Secondary Port ..... port1.0.4
  Status ..... Blocked
  Is On Common Segment ..... No
  Blocking Control ..... Physical
Hello Time ..... 1 s
Failover Time ..... 2 s
Ring Flap Time ..... 0 s
Trap ..... Enabled
Enhanced Recovery ..... Disabled
SLP Priority ..... 12
-----
```

Parameters displayed in the output of the show epsr command

Parameter on Master Node	Parameter on Transit Node	Description
Name	Name	The name of the EPSR instance.

Parameter on Master Node	Parameter on Transit Node	Description
Mode	Mode	The mode in which the EPSR instance is configured - either Master or Transit
Status	Status	Indicates whether the EPSR instance is enabled or disabled
State	State	Indicates state of the EPSR instance's state machine. Master states are: Idle, Complete, and Failed. Transit states are Links-Up, Links-Down, and Pre-Forwarding.
Control Vlan	Control Vlan	Displays the VID of the EPSR instance's control VLAN.
Data VLAN(s)	Data VLAN(s)	The VID(s) of the instance's data VLANs.
Interface Mode	Interface Mode	Whether the EPSR instance's ring ports are both physical ports (Ports Only) or are both static aggregators (Channel Groups Only).
Primary Port	First Port	The EPSR instance's primary ring port.
- Status	- Status	Whether the ring port is forwarding (Forwarding) or blocking (Blocked), or has link down (Down), and if forwarding or blocking, "(logical)" indicates the instance has only logically set the blocking state of the port because it does not have physical control of it.
	- Direction	The ring port on which the last EPSR control packet was received is indicated by "Upstream". The other ring port is then "Downstream"
- Is On Common Segment	- Is On Common Segment	Whether the ring port is on a shared common segment link to another node, and if so, "(highest rank)" indicates it is the highest priority instance on that common segment.
- Blocking Control	- Blocking Control	Whether the instance has "physical" or "logical" control of

Parameter on Master Node	Parameter on Transit Node	Description
		the ring port's blocking in the instance's data VLANs.
Secondary Port	Second Port	The EPSR instance's secondary port.
- Status	- Status	Whether the ring port is forwarding (Forwarding) or blocking (Blocked), or has link down (Down), and if forwarding or blocking, "(logical)" indicates the instance has only logically set the blocking state of the port, because it does not have physical control of it. Note that on a master configured for SuperLoop Prevention (non-zero priority) its secondary ring port can be physically forwarding, but logically blocking. This situation arises when it is not the highest priority node in the topology (and so does not receive LINKS-DOWN messages upon common segment breaks) and a break on a common segment in its ring is preventing reception of its own health messages.
	- Direction	The ring port on which the last EPSR control packet was received is indicated by "Upstream". The other ring port is then "Downstream"
- Is On Common Segment	- Is On Common Segment	Whether the ring port is on a shared common segment link to another node, and if so, "(highest rank)" indicates it is the highest priority instance on that common segment
- Blocking Control	- Blocking Control	Whether the instance has "physical" or "logical" control of the ring port's blocking in the instance's data VLANs
Hello Time		The EPSR instance's setting for the interval between transmissions of health check messages (in seconds)

Parameter on Master Node	Parameter on Transit Node	Description
Failover Time		The time (in seconds) the EPSR instance waits to receive a health check message before it decides the ring is down
Ring Flap Time		The minimum time the EPSR instance must remain in the failed state
Trap	Trap	Whether the EPSR instance has EPSR SNMP traps enabled
Enhanced Recovery	Enhanced Recovery	Whether the EPSR instance has enhanced recovery mode enabled
SLP Priority	SLP Priority	The EPSR instance's priority (for SuperLoop Prevention)

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)
[show epsr counters](#)

show epsr common segments

Overview This command displays information about all the superloop common segment ports on the switch.

Syntax show epsr common segments

Mode User Exec and Privileged Exec

Example To display information about all the superloop common segment ports on the switch, use the command:

```
awplus# show epsr common segments
```

Example output from the show epsr common segments command

EPSR Common Segments						
Common Seg Ring Port	EPSR Instance	Mode	Prio	Port Type	Phys Ctrl of Port?	Ring Port Status
port1.0.4	test_inst_Red	Transit	127	Second	Yes	Fwding
	test_inst_Blue	Transit	126	Second	No	Fwding (logical)
	test_inst_Green	Transit	125	First	No	Fwding (logical)
sa4	testA	Master	15	Primary	Yes	Blocking
	testB	Transit	14	Second	No	Fwding (logical)
sa5	test_55	Transit	8	First	Yes	Down
	test_77	Transit	7	First	No	Down

Related commands [show epsr](#)
[show epsr summary](#)
[show epsr counters](#)

show epsr config-check

Overview This command checks the configuration of a specified EPSR instance, or all EPSR instances.

If an instance is enabled, this command will check for the following errors or warnings:

- The control VLAN has the wrong number of ports.
- There are no data VLANs.
- Some of the data VLANs are not assigned to the ring ports.
- The instance is a master with its secondary port on a common segment.

Syntax show epsr [*<instance>*] config-check

Parameter	Description
<i><instance></i>	Name of the EPSR instance to check on.

Mode User Exec and Privileged Exec

Example To check the configuration of all EPSR instances and display the results, use the command:

```
awplus# show epsr config-check
```

Example output from show epsr config-check

EPSR Instance	Status	Description
red	OK.	
white	OK.	
blue	Warning	Primary port is not in data VLANs 29-99.
orange	OK.	
Don't forget to check that this node's configuration is consistent with all other nodes in the ring.		

Related commands [show epsr](#)

show epsr <epsr-instance>

Overview This command displays information about the specified EPSR instance.

Syntax show epsr <epsr-instance>

Parameter	Description
<epsr-instance>	Name of the EPSR instance.

Mode User Exec and Privileged Exec

Example To show the current settings of the EPSR instance called blue, use the command:

```
awplus# show epsr blue
```

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)
[show epsr counters](#)

show epsr <epsr-instance> counters

Overview This command displays counter information about the specified EPSR instance.

Syntax show epsr <epsr-instance> counters

Parameter	Description
<epsr-instance>	Name of the EPSR instance.

Mode User Exec and Privileged Exec

Example To show the counters of the EPSR instance called blue, use the command:

```
awplus# show epsr blue counters
```

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)
[show epsr](#)

show epsr counters

Overview This command displays counter information about all EPSR instances.

Syntax show epsr counters

Mode User Exec and Privileged Exec

Example To show the counters of all EPSR instances, use the command:

```
awplus# show epsr counters
```

Related commands [epsr mode master controlvlan primary port](#)
[epsr mode transit controlvlan](#)
[show epsr](#)

show epsr summary

Overview This command displays summary information about all EPSR instances on the switch

Syntax show epsr summary

Mode User Exec and Privileged Exec

Example To display EPSR summary information, use the command:
awplus# show epsr summary

Example output from the show epsr summary command

EPSR Summary Information

Abbreviations:

M = Master node

T = Transit node

C = is on a common segment with other instances

P = instance on a common segment has physical control of the shared port's data VLAN blocking

LB = ring port is Logically Blocking - applicable to master only

EPSR Instance	Mode	Status	State	Ctrl VLAN	Prio	Primary/1st Port Status	Secondary/2nd Port Status
test-12345	T	Enabled	Links-Down	6	127	Blocking (C,P)	Blocking (C,P)
test1	M	Enabled	Complete	5	12	Fwding	Fwding (LB)
test2	T	Enabled	Pre-Fwding	4	126	Fwding (C)	Blocking (C)
localB	T	Disabled	Idle	40	0	Unknown	Unknown
localC	T	Disabled	Idle	41	0	Unknown	Unknown

undebug epsr

Overview This command applies the functionality of the **no** variant of the **debug epsr**.

53

G.8032 Ethernet Ring Protection Switching Commands

- Contents**
- **Introduction** on page 2680
 - **cfm-sf-notify** on page 2681
 - **clear g8032 erp-instance** on page 2683
 - **clear g8032 erp-instance statistics** on page 2685
 - **data-traffic** on page 2686
 - **debug g8032** on page 2688
 - **enable (g8032-profile)** on page 2689
 - **epsr topology-change** on page 2690
 - **erp-instance** on page 2692
 - **g8032 erp-instance** on page 2694
 - **g8032 forced-switch erp-instance** on page 2696
 - **g8032 manual-switch erp-instance** on page 2698
 - **g8032 physical-ring** on page 2700
 - **g8032 profile** on page 2702
 - **level (g8032-switch)** on page 2703
 - **physical-ring** on page 2704
 - **profile name** on page 2705
 - **raps-channel** on page 2706
 - **service onm** on page 2707
 - **rpl role** on page 2708
 - **show debugging g8032** on page 2710
 - **show g8032 erp-instance** on page 2711
 - **show g8032 erp-instance statistics** on page 2716
 - **show g8032 physical-ring** on page 2719
 - **show g8032 profile** on page 2721
 - **sub-ring** on page 2723
 - **timer (g8032-profile)** on page 2725
 - **topology-change** on page 2727
 - **trap (g8032-switch)** on page 2729
 - **undebg g8032** on page 2730

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure G.8032 Ethernet Ring Protection Switching.

For more information, see the [**G.8032 Ethernet Ring Protection Switching Feature Overview and Configuration Guide**](#).

cfm-sf-notify

Overview Use this command to configure this ERP instance to receive signal fail notifications from a Local MEP(s). This command can be used multiple times to allow multiple Local MEPs to be specified.

Use the **no** variant of this command to remove a Local MEP from sending notifications to this G.8032 ERP instance.

Syntax `cfm-sf-notify mep mpid <mep-id> domain <domain-name> service <ma-name>`
`no cfm-sf-notify mep mpid <mep-id> domain <domain-name> service <ma-name>`

Parameter	Description
mep	Specify that a Local Maintenance End Point (MEP) is to provide the Signal Fail notification to this G.8032 ERP instance.
mpid	Specify that the Local MEP is to be identified by MEP-id.
<mep-id>	1-8191. Specify the Local MEP's ID.
domain	Specify the Maintenance Domain that the Local MEP is associated with.
<domain-name>	Specify the Maintenance Domain's CLI instance name.
service	Specify the Maintenance Association that the Local MEP is associated with.
<ma-name>	Specify the Maintenance Association's CLI instance name.

Mode G8032 Configure Switch

Usage notes CFM and Continuity Check Messaging (CCM) can be configured to detect link faults on the East or West interface ports as a whole, or faults on the R-APS VLAN on the East or West interface. In this situation CFM Local MEPs can notify G.8032 of defects it detects. G.8032 will treat these notifications as a Signal Fail (SF) for that East or West ring port. Similarly, CFM Local MEPs can notify G.8032 that the fault has cleared. When this command is used, this G.8032 ERP instance will ensure that the specified Local MEP is a Down MEP for the East or West interface used by this instance or for the R-APS VLAN on the East or West interface used by this instance.

Example To configure an ERP instance to receive signal fail notifications from a local MEP with an MEP ID of "12", an MD named "MD-INST1", and an MA named "MA-INST1-1", use the following commands:

```
awplus(config)# g8032 erp-instance ring2
awplus(g8032-config-switch)# cfm-sf-notify mep mpid 12 domain
MD-INST1 service MA-INST1-1
```

Related commands

- ethernet cfm domain-name**
- ethernet cfm mep**
- g8032 erp-instance**
- service ma-name**
- show g8032 erp-instance**

Command changes

- Version 5.4.7-0.1: command added
- Version 5.4.7-1.1: added to x310 series products
- Version 5.4.7-2.1: added to x550 series products
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

clear g8032 erp-instance

Overview Use this command to:

- trigger a reversion immediately, without waiting for timers to expire, or
- clear a forced-switch or manual-switch command that was previously successfully entered on a G.8032 Ethernet Ring Protection (ERP) instance.

Syntax clear g8032 erp-instance *<erp-instance-name>*

Parameter	Description
<i><erp-instance-name></i>	The name of the G.8032 ERP instance

Mode Privileged Exec

Usage notes This command can be used after a protection switch has occurred and the failure has cleared. If reversion is enabled, this command will trigger a reversion immediately, without having to wait for certain timers to expire (such as WTB or WTR). If reversion has been disabled, this command will trigger a reversion.

Alternatively, this command can be used on an ERP instance where a forced-switch or manual-switch command has been successfully entered to clear that action. The command will be ignored if a force-switch or manual-switch command had not been previously entered successfully, even if such node is in the FORCED_SWITCH or MANUAL_SWITCH state.

Examples To trigger a reversion immediately without waiting for a timer to expire on an ERP instance named "blue", use the following command:

```
awplus# clear g8032 erp-instance blue
```

Alternatively, to clear a previously applied forced-switch from an ERP instance named "blue", use the following command:

```
awplus# clear g8032 erp-instance blue
```

The forced-switch would be created using a command like this one, which forces a protection switch on the East interface of an ERP instance named "blue":

```
awplus# g8032 forced-switch erp-instance blue east-interface
```

Related commands

- [g8032 erp-instance](#)
- [g8032 forced-switch erp-instance](#)
- [g8032 manual-switch erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

clear g8032 erp-instance statistics

Overview Use this command to clear the statistics data being collected by a G.8032 Ethernet Ring Protection (ERP) instance.

Syntax `clear g8032 erp-instance <erp-instance-name> statistics`

Parameter	Description
<code><erp-instance-name></code>	The name of a specific G.8032 ERP instance

Mode Privileged Exec

Usage notes A G.8032 ERP instance keeps statistical data as counts on a variety of data such as the number of certain types of Ring-Automatic Protection Switching (R-APS) messages sent and received over its ring port(s) and error conditions detected. Use this command to clear the statistics data.

Example To clear the statistics for an ERP instance named “blue”, use the following command:

```
awplus# clear g8032 erp-instance blue statistics
```

Related commands [g8032 erp-instance](#)
[show g8032 erp-instance statistics](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

data-traffic

Overview Use this command to add a data traffic VLAN or a range of VLANs to be protected by this G.8032 Ethernet Ring Protection (ERP) instance.

Use the **no** variant of this command to remove a data traffic VLAN or a range of VLANs.

Syntax data-traffic <vid-list>
no data-traffic <vid-list>

Parameter	Description
<vid-list>	The data traffic VLAN ID(s). This can be a single VLAN ID, or can be a range of VLAN IDs separated by hyphen, or a comma separated list of VLAN IDs and ranges. Each VLAN ID can take on the range of 1 to 4094

Mode G8032 Configure Switch

- Usage notes**
- A G.8032 ERP instance can protect 0, 1 or more VLANs carrying data traffic.
 - This ERP instance must be associated with a physical ring instance.
 - Other ERP instances using the same physical ring instance are not allowed to have the same data traffic VLAN(s) as this ERP instance.
 - The data VLAN(s) must already exist.
 - The data VLAN(s)' port members should be members of the ring interface(s), but it is not enforced.
 - When a data traffic VLAN(s) is removed, any blocks that were in place on the ring ports for this VLAN(s) are removed. The user should make sure when removing the VLAN(s) from the ERP instance that a loop is not formed.
 - Data traffic VLAN(s) can be added or removed while the ERP instance is enabled or disabled.

Example To add a data traffic VLAN with a VLAN ID of "103" to an ERP instance named "blue", use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# data-traffic 103
```

Related commands **g8032 erp-instance**
show g8032 erp-instance

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

debug g8032

Overview Use this command to enable G.8032 debugging.
Use the **no** variant of this command to disable G.8032 debugging.

Syntax debug g8032 {all|event|rx|tx}
no debug g8032 {all|event|rx|tx}

Parameter	Description
all	Turn on all G.8032 debugging
event	Turn on G.8032 Event debugging
rx	Turn on G.8032 Receive debugging
tx	Turn on G.8032 Transmit debugging

Mode Privileged Exec

Example To enable all G.8032 debugging, use the following command:
awplus# debug g8032 all

Related commands [show debugging](#)
[show debugging g8032](#)
[undebug g8032](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

enable (g8032-profile)

Overview Use this command to change the revertive or non-revertive operation of the associated G.8032 Ethernet Ring Protection (ERP) instance.

Syntax enable {revertive|non-revertive}

Parameter	Description
revertive	This allows the ERP instance associated with this profile to operate in revertive mode.
non-revertive	This allows the ERP instance associated with this profile to operate in non-revertive mode.

Default By default, the mode of operation is revertive.

Mode G8032 Profile Configuration

Usage notes An ERP instance uses a profile which contains timer configurations and configurations for revertive modes of operation. Once a ring failure has abated, a G.8032 ring instance will check its mode of operation, and if the mode is revertive, it will attempt to revert back to where the RPL-Owner controls the blocking of the ring. Otherwise, it operates in non-revertive mode.

Example To enable revertive mode for a profile named "prof_1", use the following commands:

```
awplus(config)# g8032 profile prof_1
awplus(g8032-profile-config)# enable revertive
```

Related commands [g8032 profile](#)
[show g8032 profile](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

epsr topology-change

Overview Use this command to allow the given EPSR instance to accept notifications from other topology protocols, namely G.8032, for Topology Change Notifications (TCN).

Use the **no** variant of this command to return the EPSR instance to where it does not accept TCNs from the other specified protocol, and as a result does not send out a “flush FDB” message.

Syntax `epsr <epsr-name> topology-change g8032`
`no epsr <epsr-name> topology-change g8032`

Parameter	Description
<code><epsr-name></code>	The name of the EPSR instance for which the topology-change applies to.
<code>topology-change</code>	The topology-change value to be set for the instance.
<code>g8032</code>	Specify that G.8032 is the other protocol that the topology-change notifications are allowed to be accepted from in order to send “flush FDB” messages to other EPSR nodes in the ring.

Default The default value is no notifications are accepted and in turn no “flush FDB” messages are sent.

Mode EPSR Configuration

Usage notes The purpose of this command is to allow EPSR to accept notifications from other topology protocols, namely G.8032, about Topology Change Notifications (TCN). Once EPSR accepts the TCN, it will in turn notify the other nodes on the EPSR ring to perform an FDB flush.

Example To configure an EPSR instance named “red” to accept G.8032 TCNs, use the following command:

```
awplus(config-epsr)# epsr red topology-change g8032
```

To configure an EPSR instance named “red” to no longer accept G.8032 TCNs, use the following command:

```
awplus(config-epsr)# no epsr red topology-change g8032
```

Related commands [show epsr](#)
[show g8032 erp-instance](#)

Command changes Version 5.4.7-1.1: command added

erp-instance

Overview Use this command to enable or disable a G.8032 Ethernet Ring Protection (ERP) instance.

Syntax `erp-instance {enabled|disabled}`

Parameter	Description
enabled	The G.8032 ERP instance is enabled
disabled	The G.8032 ERP instance is disabled

Default The ERP instance is disabled.

Mode G8032 Configure Switch

Usage notes Once a G.8032 ERP instance has been configured with the correct parameter settings or defaults, it can be enabled to run the G.8032 protocol. To change certain ERP instance parameters, the instance may need to be disabled.

When enabled, the instance is restarted back to the G8032_ST_INIT state. In this state, if the node has an RPL-Owner or RPL-Neighbor port, it will be blocked. Otherwise the node will block one of its ring ports. All the nodes will send Ring-Automatic Protection Switching (R-APS) messages initially. The G.8032 protocol and state machines will transition the ring into another more appropriate state.

When disabled, the ERP instance will no longer process incoming R-APS messages for that instance, nor send any R-APS messages. The raps-channel VLAN and any data-traffic VLANs used by this instance will be put in the forwarding state for its physical ring ports. Caution should be taken to avoid loops when disabling an ERP instance.

Example To enable an ERP instance named "blue", use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# erp-instance enabled
```

Related commands [g8032 erp-instance](#)
[show g8032 erp-instance](#)
[trap \(g8032-switch\)](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

g8032 erp-instance

Overview Use this command to create a G.8032 Ethernet Ring Protection (ERP) instance, or to enter an existing instance's context.

Use the **no** variant of this command to destroy the specified instance.

Syntax g8032 erp-instance <erp-instance-name>
no g8032 erp-instance <erp-instance-name>

Parameter	Description
<erp-instance-name>	The name of the G.8032 ERP instance. This can be up to 32 characters.

Mode Global Configuration

Usage notes The ERP protocol in AlliedWare Plus™ can run one or more instances. A G.8032 ERP instance is made up of:

- two ERP ring ports,
- a Control VLAN that carries Ring-Automatic Protection Switching (R-APS) messages, and
- zero, one, or more Protected traffic data VLANs that the instance protects when the ring fails.

An ERP instance must be associated with a G.8032 physical ring and a G.8032 profile.

Example To enter the context of an instance named "blue", use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)#
```

Related commands

- clear g8032 erp-instance**
- clear g8032 erp-instance statistics**
- data-traffic**
- erp-instance**
- g8032 forced-switch erp-instance**
- g8032 manual-switch erp-instance**
- level (g8032-switch)**
- physical-ring**
- profile name**
- raps-channel**
- rpl role**
- show g8032 erp-instance**
- show g8032 erp-instance statistics**
- sub-ring**
- topology-change**

Command changes

- Version 5.4.7-0.1: command added
- Version 5.4.7-1.1: added to x310 series products
- Version 5.4.7-2.1: added to x550 series products
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

g8032 forced-switch erp-instance

Overview Use this command to force a protection switch on a G.8032 Ethernet Ring Protection (ERP) instance ring port.

Syntax `g8032 forced-switch erp-instance <erp-instance-name> {east-interface|west-interface|terminating-interface}`

Parameter	Description
<erp-instance-name>	The name of the G.8032 ERP instance
east-interface	The G.8032 ERP instance's East ring port
west-interface	The G.8032 ERP instance's West ring port
terminating-interface	The G.8032 ERP instance's Terminating ring port

Mode Privileged Exec

Usage notes G.8032 supports a Forced Protection Switch action initiated by the operator. A Forced Protection Switch command is to be issued at a given G.8032 node and given port in the ring. This results in a block being applied at that ring port (and an unblock on the opposite ring port), and a R-APS designated Forced Switch message to flow around the ring causing the RPL to become unblocked.

Multiple Forced Switch actions can take place along a G.8032 ring. Care must be taken when using the Force Switch command as it can only be undone by issuing a Clear command and not by a failure nor the clearing of a failure. If a node that was issued a Force Switch command later fails, then it becomes difficult to remove the Force Switch condition from the ring. In this situation, the operator has to go to the nodes that are adjacent to the failed node, and for each one, issue a Forced Switch command on the ring link facing the failed node followed by a Clear command.

If the G.8032 Physical Ring instance associated with the specified ERP instance is set to terminating-interface, then only one ring port is available and terminating-interface must be used in this command, otherwise specify the east-interface or the west-interface.

To clear this action command, use the [clear g8032 erp-instance](#) command.

Example To issue a Forced Protection Switch on the East interface of an ERP instance named "blue", use the following command:

```
awplus# g8032 forced-switch erp-instance blue east-interface
```

Related commands [clear g8032 erp-instance](#)
[g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

g8032 manual-switch erp-instance

Overview Use this command to manually cause a protection switch on a G.8032 Ethernet Ring Protection (ERP) instance ring port.

Syntax g8032 manual-switch erp-instance <erp-instance-name> {east-interface|west-interface|terminating-interface}

Parameter	Description
<erp-instance-name>	The name of the G.8032 ERP instance
east-interface	The G.8032 ERP instance's East ring port
west-interface	The G.8032 ERP instance's West ring port
terminating-interface	The G.8032 ERP instance's Terminating ring port

Mode Privileged Exec

Usage notes G.8032 supports a Manual Protection Switch action initiated by the operator. A Manual Protection Switch command is to be issued at a given G.8032 node and given port in the ring. This results in a block being applied at that ring port (and an unblock on the opposite ring port), and a R-APS designated Manual Switch message to flow around the ring causing the RPL to become unblocked.

The difference between a Manual switch and a Forced switch is that the Manual Switch will be ignored under various conditions. In particular, only one Manual Switch is allowed on a G.8032 ring at a time.

If the G.8032 Physical Ring instance associated with the specified ERP instance is set to terminating-interface, then only one ring port is available and terminating-interface must be used in this command, otherwise specify the east-interface or the west-interface.

To clear this action command, use the **clear g8032 erp-instance** command.

Example To issue a Manual Protection Switch on the East interface of an ERP instance named "blue", use the following command:

```
awplus# g8032 manual-switch erp-instance blue east-interface
```

Related commands **clear g8032 erp-instance**
g8032 erp-instance

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

g8032 physical-ring

Overview Use this command to create a G.8032 Ethernet Ring Protection (ERP) physical ring profile which specifies the Ethernet ports that will be used as G.8032 ring ports.

Syntax `g8032 physical-ring <physical-ring-name> {east-interface <interface-name1> west-interface <interface-name2>| terminating-interface <interface-name>}
no g8032 physical-ring <physical-ring-name>`

Parameter	Description
<physical-ring-name>	The name of the profile (up to 37 characters)
east-interface	The East G.8032 ring port
<interface-name1>	The name of the switch interface, either port or channel group, for the East ring port. It must differ from the West ring port.
west-interface	The West G.8032 ring port
<interface-name2>	The name of the switch interface, either port or channel group, for the West ring port. It must differ from the East ring port.
terminating-interface	The Terminating ring port. This should only be used for G.8032 ERP instance that is at the end of a sub-ring.
<interface-name>	The name of the switch interface, either port or channel group, for the Terminating ring port.

Mode Global Configuration

Usage notes Each ERP instance will be associated with a physical ring profile. A physical ring profile is made up of two physical Ethernet ports or aggregated interfaces, unless it is the terminating point of a sub-ring in which case only one port is needed. When two ports are used, they are referred to as East and West ports. When only a single port is used, it is referred to as a Terminating port.

Example To create a physical ring profile named “red” where the East interface port is port1.0.4 and the West interface port is port1.0.8, use the following commands:

```
awplus# configure terminal
awplus(config)# g8032 physical-ring red east-interface port1.0.4
west-interface port1.0.8
```

Related commands [physical-ring](#)
[rpl role](#)
[show g8032 physical-ring](#)
[sub-ring](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

g8032 profile

Overview Use this command to create a G.8032 Ethernet Ring Protection (ERP) instance profile, or to enter that instance's profile context.
Use the **no** variant of this command to destroy the specified instance.

Syntax g8032 profile {<erp-profile-name>|default-profile}
no g8032 profile <erp-profile-name>

Parameter	Description
<erp-profile-name>	The name of the G.8032 profile. This can be up to 32 characters.
default-profile	The name of the system's default profile for G.8032. This profile is created by the system automatically and can not be destroyed.

Default A profile with the name "default-profile" will exist in the system and is used by default by an ERP instance. All the parameters in the default profile take on the default values.

Mode Global Configuration

Example To enter the context of a profile named "prof_1", use the following commands:

```
awplus(config)# g8032 profile prof_1  
awplus(g8032-profile-config)#
```

Related commands [enable \(g8032-profile\)](#)
[profile name](#)
[show g8032 profile](#)
[timer \(g8032-profile\)](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

level (g8032-switch)

Overview Use this command to configure the level for Ring-Automatic Protection Switching (R-APS) messages.

Syntax level <0-7>

Parameter	Description
<0-7>	The level used by the G.8032 ERP instance.

Default The default level is 0.

Mode G8032 Configure Switch

Usage notes Inside the R-APS messages is the Level field. The G.8032 Ethernet Ring Protection (ERP) instance will use the configured level for sending R-APS messages, and is the level that the instance expects to receive. If the node receives an R-APS message with the improper level then the message will not be processed.

The ERP instance must be disabled to change the level, otherwise the setting is denied.

Example To set the R-APS message level field for an ERP instance named "blue" to 3, use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# level 3
```

Related commands [g8032 erp-instance](#)
[show g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

physical-ring

Overview Use this command to specify which G.8032 physical ring instance is to be used by this G.8032 Ethernet Ring Protection (ERP) instance.

Syntax `physical-ring <physical-ring-name>`

Parameter	Description
<code><physical-ring-name></code>	The name of the physical ring instance.

Mode G8032 Configure Switch

Usage notes A G.8032 ERP instance in general has two ring ports, unless it is at the end of a sub-ring in which case it has only one ring port. Ring port(s) are specified using a G.8032 physical ring instance.

This command can only be accepted when the ERP instance is disabled.

Example To configure an ERP instance named "blue" to use a physical ring instance named "red", use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# physical-ring red
```

Related commands [g8032 erp-instance](#)
[g8032 physical-ring](#)
[show g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

profile name

Overview Use this command to associate a G.8032 profile instance with this G.8032 Ethernet Ring Protection (ERP) instance.

Syntax profile name <erp-profile-name>

Parameter	Description
<erp-profile-name>	The name of the G.8032 profile

Default If this command is not used, a profile with the name “default-profile” will be used for this G.8032 ERP instance.

Mode G8032 Configure Switch Mode

Usage notes A G.8032 ERP instance uses a profile which contains timer configurations and configurations for revertive modes of operation. This configuration can be accepted regardless of the ERP instance being disabled or enabled. Any parameters from a changed profile will take effect the next time the G.8032 state machine uses the parameters in the updated profile.

Example To associate a G.8032 profile named “prof_1” with a G.8032 ERP instance named “blue”, use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# profile name prof_1
```

Related commands [g8032 erp-instance](#)
[g8032 profile](#)
[show g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

raps-channel

Overview Use this command to specify which VLAN to use as a channel for G.8032 Ring-Automatic Protection Switching (R-APS) messages sent and received by this G.8032 Ethernet Ring Protection (ERP) instance.

Use the **no** variant of this command to remove the VLAN from being used as the R-APS channel VLAN.

Syntax `raps-channel <vid>`
`no raps-channel`

Parameter	Description
<code><vid></code>	A single VLAN-id in the range 2 to 4094.

Mode G8032 Configure Switch

Usage notes For a G.8032 ERP instance, a VLAN is used as a channel for carrying an R-APS message. This VLAN is also used to identify the proper ring instance to all the other nodes in the ring.

The VLAN must be tagged members of the G.8032 physical ring instance associated with this ERP instance. A G.8032 physical ring instance must be associated with this ERP instance. The ERP instance can not be enabled until this raps-channel VLAN has been configured properly.

The ERP instance must be disabled when using the **no** variant.

Example To configure a VLAN with a VLAN-id of "103" as a R-APS channel for an ERP instance named "blue", use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# raps-channel 103
```

Related commands [g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

service onm

Overview Use this command to enable the ONM service, which underlies CFM and G.8032.

Use the **no** version of the command to disable the ONM service if you are not using it.

Syntax service onm
no service onm

Default Disabled

Mode Global Configuration

Usage notes The ONM service is disabled by default, to minimize memory usage on switches that are not running CFM and G.8032, particularly when many VLANs are configured on ports. Enable it before configuring CFM and G.8032.

If you disable the service, that change won't take effect until you save the configuration and restart the device.

Example To enable the ONM service, use the commands:

```
awplus# configure terminal
awplus(config)# service onm
```

To disable the ONM service, use the commands:

```
awplus# configure terminal
awplus(config)# no service onm
```

% Save the config and restart the device for this change to take effect

```
awplus(config)# exit
awplus# write
awplus# reboot
```

Command changes Version 5.5.5-0.1: default changed to disabled
Version 5.5.0-2.1: command added

rpl role

Overview Use this command to specify the role of each G.8032 Ethernet Ring Protection (ERP) ring port (also known as a link). The role can be specified as to whether it is a Ring Protection Link (RPL) or not, and if it is an RPL, whether it is the Owner or Neighbor end of an RPL.

Use the **none** variant of this command to set all the ERP instance's ring ports' RPL role to **none**.

Syntax `rpl role {owner|neighbor}{east-interface|west-interface|terminating-interface}`
`rpl role none`

Parameter	Description
owner	This sets the specified ring port to be an RPL Owner
neighbor	This sets the specified ring port to be an RPL Neighbor
east-interface	The ring port's east-interface.
west-interface	The ring port's west-interface.
terminating-interface	The ring port's terminating-interface
none	This sets all the ERP instance's ring ports' RPL role to none.

Default A RPL role of "none" is the default.

Mode G8032 Configure Switch

Usage notes If a node has one of its ring ports set to Owner or Neighbor, then **none** is automatically set on any other ring port as **none** is the only possible setting for the other ring port.

When using this command to set the RPL role to **none**, an interface need not be specified, as this command will set all the ring ports RPL role to **none**.

The command can only be accepted when the G.8032 ERP Instance is disabled, and the ERP instance must also have an association to a ERP Physical Ring instance.

As in the case of a sub-ring with only one physical ring port, use **terminating-interface** when specifying the RPL role as Owner or Neighbor.

Example To configure the east-interface of a ring port named “blue” to be an RPL Owner, use the following commands:

```
awplus(config)# g8032 erp-instance blue  
awplus(g8032-config-switch)# rpl role owner east-interface
```

Related commands **g8032 erp-instance**
g8032 physical-ring
show g8032 erp-instance

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show debugging g8032

Overview Use this command to show the debugging modes enabled for G.8032.

Syntax show debugging g8032

Mode User Exec and Privileged Exec

Example To show the debugging modes enabled for G.8032, use the following command:

```
awplus# show debugging g8032
```

Output The following shows typical output.

Example output from the show debugging g8032 command.

```
awplus#show debugging g8032
G.8032 event debugging is off
G.8032 receive debugging is off
G.8032 transmit debugging is off
```

Related commands [debug g8032](#)
[undebug g8032](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show g8032 erp-instance

Overview Use this command to show one or all G.8032 Ethernet Ring Protection (ERP) instance(s) configuration and dynamic state data.

Syntax `show g8032 erp-instance {<erp-instance-name>|all}`

Parameter	Description
<code><erp-instance-name></code>	The name of a specific G.8032 ERP instance.
<code>all</code>	Use this to show all instances.

Mode User Exec and Privileged Exec

Example To show the configuration and dynamic state data for an ERP instance named "blue", use the following command:

```
awplus# show g8032 erp-instance blue
```

Output The following shows typical output.

Example output from the show g8032 erp-instance command.

```
awplus#show g8032 erp-instance blue
```

Instance Name	: blue
Admin State	: enabled
G.8032 State	: IDLE
Failure of Proto-TO	: false
Phy Ring	: R1 - East (port2.0.25) : West (sa1)
East Link	: Link_Unblocked
West Link	: Link_blocked
RPL Role East Link	: NONE
RPL Role West Link	: OWNER
CFM MEP East	: -
CFM MEP West	: -
ERP Profile	: default-profile
Level	: 0
Ring-ID	: 1
RAPS-Channel VLAN	: 900
Sub-ring	: disabled
Virtual Channel	: disabled
Data Traffic VLANs	: 910,920,930,940
TCN To Inst	: -
TCN Flush Event	: G8032
Wait-To-Restore	: -
Wait-To-Block	: -
NodeID	: 0000.cd37.0c25
SNMP Traps	: enabled

East Receiving	West Receiving

Hold Off Timer	-
Signal Fail	-
Failure of Proto-PM	false
Version	-
Request	-
RPL-Block	-
DNF	-
Block Port Ref	-
NodeID	-

East Sending	West Sending

Version	1
Request	NR
RPL-Block	RB
DNF	1
Block Port Ref	1
NodeID	0000.cd37.0c25

Parameters in the output from the show g8032 erp-instance command.

Parameter	Description
Instance name	The configured <erp-instance-name> for this instance.
Admin State	The configured administrative state of this instance, either enabled or disabled. When the ERP instance

Parameter	Description
	is disabled, all dynamic data for other parameters in this table will be shown as "-", except for the East Link or West Link which will show the last known block or unblocked state.
G.8032 State	A dynamic parameter showing the current state of the instance per the G.8032 state machine. If the ERP Instance is disabled, it will be in the INIT state.
Phy Ring	Shows the Physical Ring Instance name that this ERP Instance is associated with along with the East/ West or Terminating Interface used by the Physical Ring Instance.
East Link or West Link	A dynamic variable showing whether the instance's ring port and its VLANs are blocked or not. In the special case of an interconnection node where a sub-ring terminates, both the East Link and the West Link are the same.
RPL Role East Link or West Link	Shows the configuration of the link's role.
CFM MEP East or West	Identifies the configured MEP, if any, that is being used to provide a CFM based Signal Fail indication to this instance. The MEP is identified by its direction (Up or Down), its MEP-id, and the Maintenance Domain (MD) and Maintenance Association (MA) it is associated with by name.
ERP Profile	Identifies the ERP Profile instance that was configured for use by this ERP Ring instance.
Level	The Level that was configured for R-APS messages that are used by this ERP Ring instance.
Ring-ID	The Ring-ID that is to be used by this ERP instance.
RAPS-Channel VLAN	The VLAN-id that is configured used for sending and receiving R-APS messages for this ERP instance.
Sub-ring	Specifies whether the ring is operating as a Sub-ring or otherwise as a Major ring.
Virtual Channel	Specifies whether the sub-ring is operating with a virtual channel or not.
Data Traffic VLANs	A comma-separated list of configured VLAN-ids (individually, or range) that are used for data-traffic and protected by this ERP instance.
TCN To Inst	A comma-separated list of protocols and their instances that are to be notified when a Topology Change Notification occurs for this ERP instance.

Parameter	Description
	This only applies to a sub-ring with a Terminating interface and in which case "-" will be displayed if no target instances have been identified. Otherwise a "-" is displayed anyway. Identifies the protocol to notify. Only "G8032" will be supported initially. <instance-name> - Identifies the instance to notify for the given protocol.
TCN Flush Event	Specifies if this instance as a target instance is to send out Flush FDB messages upon TCN notifications by a detecting instance. Identifies the notifying protocol allowed. Only "G8032" will be supported initially. If no protocols have been configured then display "-".
SNMP Traps	Indicates whether SNMP traps have been enabled or disabled for this ERP instance.
Signal Fail	Indicates whether a Signal Fail condition is being received over the East or West ring interface. <signal-fail> consists of: "-" no Signal Fail is being indicated "Link" - indicates the interface port or LAG has gone operationally down. "CFM MEP <mep-id>" - indicates that a local CFM MEP has indicated a Signal Fail, and which MEP by mep-id.
Failure of Protocol	Indicates that there are defects in the receipt of an R-APS message. There are the following types: FOP-PM (Provisioning Mismatch) - "true" indicates per G.8032, that the RPL-Owner is receiving R-APS(NR,RB) messages with a node-id not of itself. In addition, since the initial implementation does not support version 1, any R-APS messages with version 1 will also indicate a FOP-PM error. The FOP-PM error can occur on an East or a West Port. FOP-TO (Time Out) - "true" indicates that a node has not received an R-APS message on any of its ring ports for 3.5 times the R-APS message interval even though one or both ring ports are capable of receiving R-APS messages (no SF, Admin Up).
Version	The version of the R-APS message that is being received or sent over the East or West ring interface. An R-APS message version of "1" corresponds to G.8032 version 2.
Request	Indicates the protection switch request being sent or received in the R-APS message. Consists of one of: NR - No Request for protection switching SF - Signal Fail MS - Manual Switch request FS - Force Switch request Event - Request a Flush to be performed. Note this is a transient condition.

Parameter	Description
RPL Block	Indicates whether the RPL is being blocked or not. consists of one of the following: "RB" - RPL Block is being applied by the RPL-Owner. "-" - No RPL Block is being applied by the RPL-Owner, or the R-APS message originated from a non-RPL-Owner.
DNF	Indicates the value of the Do Not Flush bit in the R-APS message. The value is either "0" or "1".
Block Port Ref	Block Port Reference refers to the node's East or West port that is being blocked and shows as "0" or "1" in accordance to G.8032.
Node-ID	The MAC address of this Node or the MAC address used in sending/receiving R-APS messages.
East Sending or West Sending	If this local node is not sending R-APS, then all the fields are shown as "-"
Timers	Wait-to-Restore - "Running" indicates this timer is active, otherwise is "-".Wait-to-Block - "Running" indicates this timer is active, otherwise is "-".Hold Off Timer - "Running" indicates this timer is active, otherwise is "-".

Related commands

- [data-traffic](#)
- [erp-instance](#)
- [g8032 erp-instance](#)
- [level \(g8032-switch\)](#)
- [physical-ring](#)
- [profile name](#)
- [rpl role](#)
- [sub-ring](#)
- [topology-change](#)
- [trap \(g8032-switch\)](#)

Command changes

- Version 5.4.7-0.1: command added
- Version 5.4.7-1.1: added to x310 series products
- Version 5.4.7-2.1: added to x550 series products
- Version 5.4.8-0.2: added to SBx8100 series products
- Version 5.4.8-1.1: added to SBx908 GEN2 series products

show g8032 erp-instance statistics

Overview Use this command to show the G.8032 Ethernet Ring Protection (ERP) instance statistics.

Syntax `show g8032 erp-instance <erp-instance-name> statistics`

Parameter	Description
<code><erp-instance-name></code>	The name of a specific G.8032 ERP instance

Mode User Exec and Privileged Exec

Example To show the statistics for an ERP instance named “blue”, use the following command:

```
awplus# show g8032 erp-instance blue statistics
```


Output The following shows typical output.

Example output from the show g8032 erp-instance statistics command.

```
awplus#show g8032 erp-instance blue statistics
-----
Instance Name      : blue
Local Clear        : 0
FOP-T0             : 0
-----
  East Receiving   | West Receiving
-----
RAPS NR           15 | RAPS NR           11
RAPS NR-RB         2 | RAPS NR-RB         0
RAPS SF            0 | RAPS SF            0
RAPS FS            0 | RAPS FS            0
RAPS MS            0 | RAPS MS            0
RAPS Event         0 | RAPS Event         0
Drop Guard         0 | Drop Guard         0
Drop Error         0 | Drop Error         0
Local SF           1 | Local SF           1
FOP-PM             0 | FOP-PM             0
-----
  East Sending     | West Sending
-----
RAPS NR           17 | RAPS NR           17
RAPS NR-RB 20067   | RAPS NR-RB 20067
RAPS SF           10 | RAPS SF           10
RAPS FS            0 | RAPS FS            0
RAPS MS            0 | RAPS MS            0
RAPS Event         0 | RAPS Event         0
-----
```

Parameters in the output from the show g8032 erp-instance statistics command

Parameter	Description
Instance Name	The configured <erp-instance-name> for this instance.
Local clear	The number of Clear commands invoked locally.
FOP-T0	The number of Failure of Protocol Time Out events seen locally.
RAPS NR	The number of R-APS messages with a No Request (NR) being received or sent.
RAPS NR-RB	The number of R-APS messages with a No Request, RPL Blocked (NR,RB) being received or sent.
RAPS SF	The number of R-APS messages with Signal Fail (SF) being received or sent.
RAPS FS	The number of R-APS messages with Forced Switch (FS) being received or sent.

Parameter	Description
RAPS MS	The number of R-APS messages with Manual Switch (MS) being received or sent.
RAPS Event	The number of R-APS messages with Event (Flush) being received or sent.
Drop Guard	The number of R-APS messages discarded due to Guard Timer.
Drop Error	The number of R-APS messages discarded due to incorrect MAC Address (unmatched Ring-ID), incorrect version, unusable Request/State, or other invalid code point in one of the message fields.
Local SF	The number of Signal Fail events seen locally.
FOP-PM	The number of Failure of Protocol events seen locally.

Related commands [clear g8032 erp-instance statistics](#)
[g8032 erp-instance](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show g8032 physical-ring

Overview Use this command to show the G.8032 physical ring instance information.

Syntax show g8032 physical-ring {<physical-ring-name>|all}

Parameter	Description
<physical-ring-name>	The name of the physical ring
all	This shows all physical ring instances that have been configured

Mode User Exec and Privileged Exec

Example To show the details of a physical ring instance named "red", use the following command:

```
awplus# show g8032 physical-ring red
```

Output The following shows typical output.

Example output from the show g8032 physical-ring command.

```
awplus#show g8032 physical-ring red
Ring : red
=====
East   : port1.0.4
West   : port1.0.8
ERP Inst : blue
```

Parameters in the output from the show g8032 physical-ring command.

Parameter	Description
Ring	The name of the physical ring that was configured for this physical ring instance.
East, West, Terminating	The physical interface port or LAG of the East or West Ring interface, or the Terminating interface that was configured for this physical ring instance.
ERP Inst	A comma-separated list of ERP instances by name that have been configured to use this physical ring instance, or "-" if none.

Related commands [g8032 physical-ring](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

show g8032 profile

Overview Use this command to show one specific G.8032 profile or all G.8032 profiles, and the configured information within each profile.

Syntax `show g8032 profile {<erp-profile-name>|default-profile|all}`

Parameter	Description
<code><erp-profile-name></code>	The name of the G.8032 profile that was created by the user.
<code>default-profile</code>	The default name of the G.8032 profile that was created automatically by the system.
<code>all</code>	Using this will show all G.8032 profiles.

Mode User Exec and Privileged Exec

Example To show the profile details for a profile named “prof1”, use the following command:

```
awplus# show g8032 profile prof1
```

Output The following shows typical output.

Example output from the show g8032 profile command.

```
awplus#show g8032 profile prof1
Profile : prof1
=====
Wait-To-Restore : 5 mins
Hold Off Timer  : 0 ms
Guard Timer     : 500 ms
Wait-To-Block   : 5500 ms
Protection Type  : Revertive
ERP Inst        : blue
```

Parameters in the output from show g8032 profile command.

Parameter	Description
Wait-To-Restore	The configured value in <1-12> minutes.
Hold Off Timer	The configured value but shown instead in milliseconds which ranges from 0 to 10,000 (10s) in 100 ms increments.
Guard Timer	The configured value which ranges from 10 to 2000 in 10 ms increments.
Wait-To-Block	5 seconds more than the configured Guard Time. The range is 5010 to 5200.
ERP Inst	Comma separated list of ERP instances using this profile, or "-" if there are none.

Related commands [enable \(g8032-profile\)](#)
[g8032 profile](#)
[timer \(g8032-profile\)](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

sub-ring

Overview Use this command to configure the mode of operation for the G.8032 Ethernet Ring Protection (ERP) instance as a sub-ring.

Use the **no** variant of this command to change the mode of operation to that of a normal fully enclosed ring.

Syntax sub-ring
no sub-ring

Default By default the mode is **no sub-ring**.

Mode G8032 Configure Switch

Usage notes An ERP instance can operate normally as a fully enclosed ring, commonly called a major ring, or as a partially enclosed ring, called a sub-ring. Sub-rings must be attached to either a major ring (one that is fully closed) or to other sub-rings where one of the other sub-rings itself is attached to a major ring.

Setting the mode to sub-ring should also be set for all nodes in the sub-ring, as the G.8032 state machine is different from that of a major ring.

This configuration can only be accepted when the ERP instance is disabled.

When the physical ring instance used by this ERP instance is configured for terminating interface, then this ERP instance will automatically be configured to be in the sub-ring mode and can not be changed.

Example To configure an ERP instance named "blue" as a sub-ring, use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# sub-ring
```

Related commands **g8032 erp-instance**
g8032 physical-ring
show g8032 erp-instance

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

timer (g8032-profile)

Overview Use this command to configure a timer for a specified G.8032 Ethernet Ring Protection (ERP) instance profile.

Syntax timer wait-to-restore {<1-12>|default}
timer hold-off {<0-100>|default}
timer guard-timer {<1-200>|default}

Parameter	Description
wait-to-restore	This timer is used to soak signal failure abatement to ensure the signal failure abatement is not intermittent. This timer is only used by the RPL Owner when in the revertive operation, and thus is attempting to restore the ring. It is configurable in steps of 1 to 12 minutes (default is 5 minutes).
hold-off	This timer allows any other underlying protection schemes to recover before G.8032 reacts to its defect as this gives time for the G.8032 defect to clear. A classic example is when the ERP Physical ring port is carried over a SONET/SDH transmission system that itself has 50ms recovery times. If G.8032 detects a failure, then increasing this timer to some value greater than 50ms would allow the SONET/SDH system to recover and have the defect that G.8032 detected disappear thus preventing the need for G.8032 to try and recover. The Hold Off timer is configurable in 0 to 10 seconds in steps of 100ms (default is 0 ms).
guard-timer	This is the amount of time that an ERP instance discards most R-APS messages before being allowed to process them. It is used when a clearing condition occurs yet at the same time older messages are still propagating around the ring with failure indications. For example two nodes that just noticed a link failure abatement condition could start clearing and almost immediately one of them could receive an old Signal Fail indication message from the other node (that was still in flight) which in turn causes the receiving node to react to the Signal Fail inadvertently. This timer is particularly useful where R-APS propagation time through the ring is large. Refer to ITU-T G.8032 for more information. The Guard timer is configurable in 10ms steps between 10ms and 2 seconds (default is 50 for 500ms).

Mode G8032 Profile Configuration

Example To set the wait-to-restore timer of a profile named “prof_1” to a value of 1 minute, use the following commands:

```
awplus(config)# g8032 profile prof_1  
awplus(g8032-profile-config)# timer wait-to-restore 1
```

Related commands **g8032 profile**
show g8032 profile

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

topology-change

Overview Use this command to enable this G.8032 Ethernet Ring Protection (ERP) instance to send a Flush Event message after notification of a Topology Change Notification (TCN) by a detecting instance.

Use the **no** variant of this command to disable the sending of the Flush Event.

Syntax topology-change {g8032}
no topology-change {g8032}

Parameter	Description
g8032	Specify that G.8032 is the protocol that is affected by this command.

Default Topology change is enabled by default for G.8032.

Mode G8032 Configure Switch

Usage notes If this ERP instance is on an interconnecting node, then the ERP instance may need to be notified of a topology change that occurred in another G.8032 sub-ring attached to this node. The former will be termed the "target" ERP instance, and the latter the "detecting" ERP instance.

The criteria for notification is:

- the detecting ERP instance is configured as a sub-ring with a Terminating interface,
- it is protecting the same data VLANs as the target instance, and
- the target ERP instance must have two ring ports.

When the detecting ERP instance detects a topology change on its sub-ring, AlliedWare Plus™ will automatically determine which target ERP instance(s) needs to be notified. It does this by comparing the same data VLANs in the detecting ERP instance with all the other instances.

If target ERP instances are identified and these instances also have both an East and a West interface configured, then those target instances are notified. Upon notification, the target ERP instance has a couple of actions that it has to perform:

- To flush the FDB on both its East and West interfaces for the protected VLANs.
- To send out an R-APS flush event message over its East and West interfaces. The flush event message is sent around the target ring and each node on the target ring will perform an FDB flush of its protected VLANs. The sending of a R-APS flush event may not be needed in some cases and as such it is configurable.

Example To enable sending of R-APS flush event messages on an ERP instance named "blue", use the following commands:

```
awplus(config)# g8032 erp-instance blue  
awplus(g8032-config-switch)# topology-change g8032
```

Related commands **g8032 erp-instance**
show g8032 erp-instance

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

trap (g8032-switch)

Overview Use this command to enable or disable SNMP traps for a G.8032 Ethernet Ring Protection (ERP) instance.

Syntax trap {enabled|disabled}

Parameter	Description
enabled	Enable this ERP instance to generate traps.
disabled	Disable this ERP instance from generating traps.

Default The SNMP traps for the ERP instance are enabled.

Mode G8032 Configure Switch

Usage notes Globally, ERP traps are disabled by default but can be enabled globally using the [snmp-server enable trap](#) command.

Example To disable the SNMP traps for an ERP instance named “blue”, use the following commands:

```
awplus(config)# g8032 erp-instance blue
awplus(g8032-config-switch)# trap disabled
```

Related commands [erp-instance](#)
[show g8032 erp-instance](#)
[snmp-server enable trap](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

undebug g8032

Overview Use this command to turn off debugging for various G.8032 debug attributes.

Syntax undebug g8032 {all|event|rx|tx}

Parameter	Description
all	All G.8032 debugging
event	G.8032 debugging events
rx	G.8032 debugging Receive activities
tx	G.8032 debugging Transmit activities

Mode Privileged Exec

Example To turn off all G.8032 debugging, use the following command:

```
awplus# undebug g8032 all
```

Related commands [debug g8032](#)
[show debugging g8032](#)

Command changes Version 5.4.7-0.1: command added
Version 5.4.7-1.1: added to x310 series products
Version 5.4.7-2.1: added to x550 series products
Version 5.4.8-0.2: added to SBx8100 series products
Version 5.4.8-1.1: added to SBx908 GEN2 series products

Part 7: Network Management

54

AMF and AMF Plus Commands

- Contents**
- **Introduction** on page 2736
 - **application-proxy ip-filter** on page 2737
 - **application-proxy quarantine-vlan** on page 2738
 - **application-proxy redirect-url** on page 2739
 - **application-proxy threat-protection** on page 2740
 - **application-proxy threat-protection send-summary** on page 2742
 - **application-proxy whitelist advertised-address** on page 2743
 - **application-proxy whitelist enable** on page 2744
 - **application-proxy whitelist protection tls** on page 2746
 - **application-proxy whitelist server** on page 2747
 - **application-proxy whitelist trustpoint (deprecated)** on page 2749
 - **area-link** on page 2750
 - **atmf-arealink** on page 2752
 - **atmf-link** on page 2754
 - **atmf amfplus-license-only** on page 2756
 - **atmf area** on page 2758
 - **atmf area password** on page 2760
 - **atmf authorize** on page 2762
 - **atmf authorize provision** on page 2764
 - **atmf backup** on page 2766
 - **atmf backup area-masters delete** on page 2768
 - **atmf backup area-masters enable** on page 2769
 - **atmf backup area-masters now** on page 2770
 - **atmf backup area-masters synchronize** on page 2771
 - **atmf backup bandwidth** on page 2772
 - **atmf backup delete** on page 2773
 - **atmf backup enable** on page 2774
 - **atmf backup guests delete** on page 2775
 - **atmf backup guests enable** on page 2776
 - **atmf backup guests now** on page 2777
 - **atmf backup guests synchronize** on page 2778
 - **atmf backup now** on page 2779
 - **atmf backup redundancy enable** on page 2781
 - **atmf backup server** on page 2782
 - **atmf backup stop** on page 2784
 - **atmf backup synchronize** on page 2785
 - **atmf cleanup** on page 2786

- **atmf container** on page 2787
- **atmf container login** on page 2789
- **atmf controller** on page 2790
- **atmf distribute firmware** on page 2791
- **atmf domain vlan** on page 2793
- **atmf enable** on page 2796
- **atmf group (membership)** on page 2797
- **atmf guest-class** on page 2799
- **atmf log-verbose** on page 2801
- **atmf management subnet** on page 2802
- **atmf management vlan** on page 2805
- **atmf master** on page 2808
- **atmf mtu** on page 2809
- **atmf network-name** on page 2810
- **atmf provision (interface)** on page 2811
- **atmf provision node** on page 2812
- **atmf reboot-rolling** on page 2814
- **atmf recover** on page 2818
- **atmf recover guest** on page 2820
- **atmf recover led-off** on page 2821
- **atmf recover over-eth** on page 2822
- **atmf recovery-server** on page 2823
- **atmf remote-login** on page 2825
- **atmf restricted-login** on page 2827
- **atmf retry guest-link** on page 2829
- **atmf secure-mode** on page 2830
- **atmf secure-mode certificate expire** on page 2832
- **atmf secure-mode certificate expiry** on page 2833
- **atmf secure-mode certificate renew** on page 2834
- **atmf secure-mode enable-all** on page 2835
- **atmf select-area** on page 2837
- **atmf topology-gui enable** on page 2838
- **atmf trustpoint** on page 2840
- **atmf virtual-crosslink** on page 2842
- **atmf virtual-link** on page 2844
- **atmf virtual-link description** on page 2848
- **atmf virtual-link protection** on page 2849
- **atmf working-set** on page 2851
- **bridge-group (amf-container)** on page 2854
- **clear application-proxy threat-protection** on page 2856
- **clear atmf links** on page 2857
- **clear atmf links virtual** on page 2858
- **clear atmf links statistics** on page 2859
- **clear atmf recovery-file** on page 2860
- **clear atmf secure-mode certificates** on page 2861
- **clear atmf secure-mode statistics** on page 2862
- **clone (amf-provision)** on page 2863
- **configure boot config (amf-provision)** on page 2866

- **configure boot system (amf-provision)** on page 2868
- **copy (amf-provision)** on page 2870
- **create (amf-provision)** on page 2872
- **debug atmf** on page 2875
- **debug atmf packet** on page 2877
- **delete (amf-provision)** on page 2880
- **discovery** on page 2882
- **description (amf-container)** on page 2884
- **erase factory-default** on page 2885
- **firmware-url** on page 2886
- **http-enable** on page 2888
- **identity (amf-provision)** on page 2890
- **license-cert (amf-provision)** on page 2893
- **locate (amf-provision)** on page 2895
- **log event-host** on page 2897
- **login-fallback enable** on page 2898
- **modeltype** on page 2899
- **service atmf-application-proxy** on page 2900
- **show application-proxy threat-protection** on page 2901
- **show application-proxy whitelist advertised-address** on page 2903
- **show application-proxy whitelist interface** on page 2904
- **show application-proxy whitelist server** on page 2906
- **show application-proxy whitelist supplicant** on page 2907
- **show atmf** on page 2909
- **show atmf area** on page 2913
- **show atmf area guests** on page 2917
- **show atmf area guests-detail** on page 2919
- **show atmf area nodes** on page 2922
- **show atmf area nodes-detail** on page 2924
- **show atmf area summary** on page 2926
- **show atmf authorization** on page 2927
- **show atmf backup** on page 2930
- **show atmf backup area** on page 2935
- **show atmf backup guest** on page 2937
- **show atmf container** on page 2940
- **show atmf detail** on page 2944
- **show atmf group** on page 2947
- **show atmf group members** on page 2949
- **show atmf guests** on page 2951
- **show atmf guests detail** on page 2953
- **show atmf links** on page 2956
- **show atmf links detail** on page 2958
- **show atmf links guest** on page 2966
- **show atmf links guest detail** on page 2968
- **show atmf links statistics** on page 2972
- **show atmf nodes** on page 2975
- **show atmf provision nodes** on page 2977

- **show atmf recovery-file** on page 2979
- **show atmf secure-mode** on page 2980
- **show atmf secure-mode audit** on page 2983
- **show atmf secure-mode audit link** on page 2984
- **show atmf secure-mode certificates** on page 2985
- **show atmf secure-mode sa** on page 2988
- **show atmf secure-mode statistics** on page 2991
- **show atmf tech** on page 2993
- **show atmf virtual-links** on page 2997
- **show atmf working-set** on page 2999
- **show debugging atmf** on page 3000
- **show debugging atmf packet** on page 3001
- **show running-config atmf** on page 3002
- **state** on page 3003
- **switchport atmf-agentlink** on page 3005
- **switchport atmf-arealink** on page 3007
- **switchport atmf-crosslink** on page 3009
- **switchport atmf-guestlink** on page 3011
- **switchport atmf-link** on page 3013
- **type atmf guest** on page 3014
- **type atmf node** on page 3015
- **undebg atmf** on page 3018
- **username (atmf-guest)** on page 3019

Introduction

Overview This chapter provides an alphabetical reference for AMF and AMF Plus commands. AMF is the Allied Telesis Autonomous Management Framework™, and AMF Plus is an expanded version of AMF. Both AMF and AMF Plus are a suite of features that combine to simplify network management across all supported network equipment from the core to the edge. They also integrate with Vista Manager, our graphical monitoring and management platform.

On the AlliedWare Plus command line, AMF and AMF Plus are identical. The difference between them is in Vista Manager, where AMF Plus includes additional AMF Plus intent-based networking features.

In the rest of this chapter, we use 'AMF' to refer to both AMF and AMF Plus.

AMF master nodes Every AMF network must have at least one master node, which acts as the core of the AMF network. Not all AlliedWare Plus devices are capable of acting as a AMF master. See the [AMF Feature Overview and Configuration Guide](#) for information about master support.

AMF edge AlliedWare Plus CentreCOM® Series switches can only be used as edge switches in an AMF network. The full management power and convenience of AMF is available on these switches, but they can only link to one other AMF node. They cannot form cross-links or virtual links.

AMF naming convention When AMF is enabled on a device, it will automatically be assigned a host name. If a host name has already been assigned, by using the command [hostname](#), this will remain. If however, no host name has been assigned, then the name applied will be the prefix, **host_** followed (without a space) by the MAC address of the device. For example, a device whose MAC address is **0016.76b1.7a5e** will have the name **host_0016_76b1_7a5e** assigned to it.

To efficiently manage your network using AMF, we strongly advise that you devise a naming convention for your network devices, and apply an appropriate hostname to each device in your AMF network.

AMF and STP On AR-Series UTM firewalls and Secure VPN routers, you cannot use STP at the same time as AMF.

application-proxy ip-filter

Overview Use this command to enable global IP filtering on a device. Once enabled the device will add a global ACL in response to a threat message from an AMF Security (AMF-Sec) Controller.

Use the **no** variant of this command to disable global IP filtering.

Syntax application-proxy ip-filter
no application-proxy ip-filter

Default Global IP filtering is disabled by default.

Mode Global Configuration

Usage notes For this feature to work, the AMF Application Proxy service needs to be enabled on your network, using the command **service atmf-application-proxy**.

Example To enable global IP filtering, use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy ip-filter
```

To disable global IP filtering, use the commands:

```
awplus# configure terminal
awplus(config)# no application-proxy ip-filter
```

Related commands **application-proxy redirect-url**
application-proxy threat-protection
clear application-proxy threat-protection
service atmf-application-proxy
show application-proxy threat-protection

Command changes Version 5.4.7-2.5: command added

application-proxy quarantine-vlan

Overview Use this command to set the quarantine VLAN to use when an AMF Security (AMF-Sec) Controller detects a threat. The port/s on which the threat is detected are moved to this VLAN if the **application-proxy threat-protection** action is set to **quarantine**.

Use the **no** variant of this command to delete the quarantine VLAN. If no quarantine VLAN is specified then no quarantine action will be performed.

Syntax application-proxy quarantine-vlan <vlan-id>
no application-proxy quarantine-vlan

Parameter	Description
<i>i</i>	< The ID of the VLAN to use. In the range 1-4094.

Default By default, no quarantine VLAN is configured.

Mode Global Configuration

Example To configure VLAN 100 as the quarantine VLAN, use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy quarantine-vlan 100
```

To delete the quarantine VLAN, use the commands:

```
awplus# configure terminal
awplus(config)# no application-proxy quarantine-vlan
```

Related commands **application-proxy threat-protection**
clear application-proxy threat-protection
application-proxy threat-protection send-summary
service atmf-application-proxy
show application-proxy threat-protection

Command changes Version 5.4.7-2.2: command added

application-proxy redirect-url

Overview Use this command to redirect a user to a helpful URL when they are blocked because of an **application-proxy ip-filter**.

Use the **no** variant of this command to remove the URL redirect.

Syntax application-proxy redirect-url <url>
no application-proxy redirect-url

Parameter	Description
<url>	URL to redirect the user to.

Default No URL is configured by default.

Mode Global Configuration

Example To configure a redirect URL, use the command:

```
awplus# application-proxy redirect-url http://my.dom/help.html
```

To remove a redirect URL, use the command:

```
awplus# no application-proxy redirect-url
```

Related commands **application-proxy ip-filter**
application-proxy threat-protection
clear application-proxy threat-protection
service atmf-application-proxy
show application-proxy threat-protection

Command changes Version 5.4.9-0.1: command added

application-proxy threat-protection

Overview Use this command to set the blocking action to take when a threat detected message is received from an AMF Security (AMF-Sec) Controller.

Use the **no** variant of this command to disable threat protection blocking actions on the port.

Syntax application-proxy threat-protection {drop|link-down|quarantine|log-only}

no application-proxy threat-protection

Parameter	Description
drop	Drop the traffic that generates the threat reports. This is a Layer 2 drop. Note that the device will only drop packets that arrive at the port, not packets sent from the port.
link-down	Take the link down in response to threats, by setting it to error disabled.
quarantine	Move the offending port to a quarantine VLAN.
log-only	Log when a threat is detected.

Default Threat protection is disabled by default.

Mode Interface Configuration

Example To set the threat protection blocking action on port1.0.4 to drop, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# application-proxy threat-protection drop
```

To disable threat protection blocking actions on port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# no application-proxy threat-protection
```


Related commands **application-proxy quarantine-vlan**
application-proxy threat-protection send-summary
clear application-proxy threat-protection
service atmf-application-proxy
show application-proxy threat-protection

Command changes Version 5.5.2-0.1: added to switch ports on AR series devices
Version 5.4.9-0.1: **log-only** parameter added
Version 5.4.7-2.2: command added

application-proxy threat-protection send-summary

Overview Use this command to send a summary of all current threat-protection blocking requests to all AMF Application Proxy service nodes. This command can only be performed on an AMF master.

Syntax application-proxy threat-protection send-summary

Mode Privileged Exec

Example To send a summary of all current threat-protection blocking requests to all AMF Application Proxy service nodes, use the command:

```
awplus# application-proxy threat-protection send-summary
```

Related commands

- [application-proxy quarantine-vlan](#)
- [application-proxy threat-protection](#)
- [clear application-proxy threat-protection](#)
- [service atmf-application-proxy](#)
- [show application-proxy threat-protection](#)

Command changes Version 5.4.7-2.2: command added

application-proxy whitelist advertised-address

Overview Use this command to register a Layer 3 interface, and the IPv4 address that is attached to this interface, as the advertised application-proxy whitelist address for a device.

Use the **no** variant of this command to stop advertising the Layer 3 interface and its associated IPv4 address.

Syntax application-proxy whitelist advertised-address <interface>
no application-proxy whitelist advertised-address

Parameter	Description
<interface>	Layer 3 interface to configure as the advertised address.

Default No address advertised by default.

Mode Global Configuration

Example To configure the IPv4 address attached to VLAN 1as the advertised address, use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy whitelist advertised-address
vlan1
```

To remove the advertised address, use the commands:

```
awplus# configure terminal
awplus(config)# no application-proxy whitelist advertised-
address
```

Related commands [application-proxy whitelist server](#)
[show application-proxy whitelist advertised-address](#)

Command changes Version 5.4.9-1.1: command added

application-proxy whitelist enable

Overview Use this command to enable application-proxy whitelist based authentication on an interface.

Use the **no** variant of this command to disable the whitelist authentication.

Syntax application-proxy whitelist enable
no application-proxy whitelist enable

Default Application-proxy whitelist is disabled by default.

Mode Interface Configuration

Usage notes When **port-control** is set to **auto**, the 802.1X authentication feature is executed on the interface, but only if the **aaa authentication dot1x** command has been issued.

If you attempt to change the authentication configuration on an interface that has threat protection quarantine configured, you will see the following error message:

```
% portx.x.x: Application Proxy quarantine configuration must be removed before port authentication is changed
```

Before changing the interface's authentication configuration you must either:

- remove the interface's threat protection configuration, or
- shut down the interface.

Example To enable application-proxy whitelist authentication on the interface port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# application-proxy whitelist enable
```

To disable application-proxy whitelist authentication on the interface port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.4
awplus(config-if)# no application-proxy whitelist enable
```

Related commands **application-proxy whitelist server**
show application-proxy whitelist interface
show application-proxy whitelist server
show application-proxy whitelist supplicant

Command changes Version 5.4.9-0.1: command added

application-proxy whitelist protection tls

Overview Use this command to configure the application-proxy whitelist control channel to use TLS protection. If no trustpoint is specified then TLS will operate without authentication.

Use the **no** variant of this command to stop using TLS.

Syntax application-proxy whitelist protection tls [trustpoint <name>]
no application-proxy whitelist protection tls

Parameter	Description
trustpoint	Specify an optional trustpoint. If no trustpoint is specified then TLS will operate without authentication.
<name>	Name of the trustpoint.

Default TLS is disabled by default.

Mode Global Configuration

Example To configure an AMF application-proxy whitelist to use TLS with the trustpoint 'corpca', use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy whitelist protection tls
trustpoint corpca
```

To configure an AMF application-proxy whitelist to stop using TLS, use the commands:

```
awplus# configure terminal
awplus(config)# no application-proxy whitelist protection tls
```

Related commands [application-proxy whitelist enable](#)
[application-proxy whitelist server](#)
[show application-proxy whitelist server](#)

Command changes Version 5.5.0-2.1: command added

application-proxy whitelist server

Overview Use this command to set an AMF master to act as a whitelist authentication proxy between AMF members, acting as Network Access Servers, and an external whitelist RADIUS server.

Use the **no** variant of this command to disable the whitelist proxy functionality.

Syntax application-proxy whitelist server *<ip-address>* key *<key>*
[encrypted] [auth-port *<1-65535>*]
no application-proxy whitelist server

Parameter	Description
<i><ip-address></i>	IPv4 address of the upstream RADIUS server in dotted decimal format A.B.C.D.
key <i><key></i>	Set the shared secret encryption key for communication with the upstream RADIUS server.
encrypted	Means that the password that follows is encoded, not plain text. This parameter is only used in generated configuration files. In configuration files, the device prints encrypted in front of passwords to indicate that it is displaying the encoded password.
auth-port <i><1-65535></i>	Set the RADIUS server UDP port. This is only necessary if you don't want to use the default port 1812.

Default Disabled by default.

Mode Global Configuration

Example To configure an AMF master to work as a proxy to the external RADIUS server 192.168.1.10, with shared secret 'mysecurekey', on port 1822, use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy whitelist server 192.168.1.10
key mysecurekey auth-port 1822
```

To configure an AMF master to work as a proxy to the external RADIUS server 192.168.1.10, with shared secret 'mysecurekey', on the default port (1812), use the commands:

```
awplus# configure terminal
awplus(config)# application-proxy whitelist server 192.168.1.10
key mysecurekey
```

To disable the whitelist proxy, use the commands:

```
awplus# configure terminal
awplus(config)# no application-proxy whitelist server
```

Related commands

- application-proxy whitelist enable**
- service atmf-application-proxy**
- show application-proxy whitelist interface**
- show application-proxy whitelist server**
- show application-proxy whitelist supplicant**

Command changes

- Version 5.5.3-2.1: **encrypted** parameter added
- Version 5.4.9-0.1: command added

application-proxy whitelist trustpoint (deprecated)

Overview This command has been deprecated. It has been replaced by the **application-proxy whitelist protection tls** command.

This command sets the trustpoint to use when communicating with the external whitelist RADIUS server. This enables RADIUS over TLS (RadSec) protection.

Syntax application-proxy whitelist trustpoint <name>
no application-proxy whitelist trustpoint

Command changes Version 5.4.9-1.1: command added
Version 5.5.0-2.1: command deprecated

area-link

Overview Use this command to create an area-link between a Virtual AMF Appliance (VAA) host controller and an AMF container.

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Use the **no** variant of this command to remove an area-link from a container.

Syntax `area-link <area-name>`
`no area-link`

Parameter	Description
<code><area-name></code>	AMF area name of the container's area.

Mode AMF Container Configuration

Usage notes The AMF area-link connects the AMF controller on a VAA host to the AMF container. Once a container has been created with the [atmf container](#) command and an area-link configured with the **area-link** command, it can be enabled using the [state](#) command.

You can only configure a single area-link on a container. You will see the following message if you try and configure a second one:

% AreaLink already configured for this container

Each container has two virtual interfaces:

- Interface eth0, used to connect to the AMF controller on the VAA host via an AMF area-link, configured using this area-link command.
- Interface eth1, used to connect to the outside world using a bridged L2 network link, configured using the [bridge-group \(amf-container\)](#) command.

See the [AMF Feature Overview and Configuration_Guide](#) for more information on these virtual interfaces and links.

Example To create the area-link to “wlg” on container “vac-wlg-1”, use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# area-link wlg
```

To remove an area-link from container “vac-wlg-1”, use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# no area-link
```

Related commands [atmf container](#)
[show atmf container](#)

Command changes Version 5.4.7-0.1: command added

atmf-arealink

Overview Use this command to enable an eth interface, on a TQR, ARX or AR-series device, as an AMF area link. AMF area links are designed to operate between two nodes in different areas in an AMF network.

On ARX and AR-Series devices, this command is only available if your network is running in AMF secure mode (see [atmf secure-mode](#) for more information on AMF secure mode).

Use the **no** variant of this command to remove any AMF area links that may exist for the selected eth interface.

Syntax atmf-arealink remote-area <area-name> vlan <2-4094>
no atmf-arealink

Parameter	Description
<area-name>	The name of the remote area that the interface is connecting to.
<2-4094>	The VLAN ID for the link. This VLAN cannot be used for any other purpose, and the same VLAN ID must be used at each end of the link.

Default No area links are configured

Mode Interface configuration for an eth interface

Usage notes Run this command on the interface at both ends of the link.

Each area must have the area-name configured, and the same area password must exist on both ends of the link.

Running this command will synchronize the area information stored on the two nodes.

You can configure multiple area links between two area nodes, but only one area link at any time will be in use. All other area links will block information, to prevent network storms.

NOTE: See the command to configure an AMF area link on an a switch port or link aggregator

Example To configure eth1 as an AMF area link to the 'Auckland' area on VLAN 6, use the following commands:

```
master_1# configure terminal
master_1(config)# interface eth1
master_1(config-if)# atmf-area link remote-area Auckland vlan 6
```

To remove eth1 as an AMF area link, use the following commands:

```
master_1# configure terminal
master_1(config)# interface eth1
master_1(config-if)# no atmf-area link
```

Related commands

- [atmf area](#)
- [atmf area password](#)
- [atmf virtual-link](#)
- [show atmf links](#)

Command changes Version 5.5.0-1.1: command added

atmf-link

Overview Use this command to enable an eth interface on a TQR, ARX or AR-series device as an up/down AMF link.

On ARX and AR-Series devices, this command is only available if your network is running in AMF secure mode (see [atmf secure-mode](#) for more information on AMF secure mode).

Use the **no** variant of this command to remove any AMF link that may exist for the selected eth interface.

Syntax atmf-link
no atmf-link

Default No AMF links are configured

Mode Interface configuration for an eth interface

Usage notes Up/down links and virtual links interconnect domains in a vertical hierarchy, with the highest domain being the core domain. In effect, they form a tree of interconnected AMF domains. This tree must be loop-free. Therefore you must configure your up/down and virtual links so that no loops are formed.

On ARX and AR-series devices, if you run the command and AMF secure mode is not enabled, you will see the following error message:

```
Node_1(config)#int eth1
Node_1(config-if)#atmf-link
% Cannot configure eth1 because atmf secure-mode is not enabled.
```

NOTE: See the command to configure an AMF up/down link on an a switch port or link aggregator

Example To configure eth1 as an AMF up/down link, use the following commands:

```
Node_1# configure terminal
Node_1(config)# interface eth1
Node_1(config-if)# atmf-link
```

To remove eth1 as an AMF up/down link, use the following commands:

```
Node_1# configure terminal
Node_1(config)# interface eth1
Node_1(config-if)# no atmf-link
```

Related commands **atmf recover over-eth**
atmf secure-mode
show atmf detail
show atmf links
switchport atmf-link

Command changes Version 5.5.4-0.1: command added on TQ-R series
Version 5.5.0-1.1: command added

atmf amfplus-license-only

Overview Use this command if you want to use the AMF Plus features in Vista Manager EX, and you have a mixture of AMF and AMF Plus licenses on your master node. This command sets the AMF network to only count **AMF Plus** licensed nodes.

Use the **no** variant of this command to include both AMF and AMF Plus licenses when calculating the number of licensed nodes in an area count.

Syntax atmf amfplus-license-only
no atmf amfplus-license-only

Default The **no** version is the default. That is, consider both AMF and AMF Plus licenses when calculating the number of licensed nodes.

Mode Global Configuration

Usage notes From software version 5.5.2-2.3 onwards, AMF licenses are no longer available to purchase. Instead, AMF Plus licenses become available. Existing AMF licenses remain valid. You only need to change to AMF Plus licenses if you want to manage more nodes, or use the new AMF Plus menu in Vista Manager.



CAUTION: *If the network has more AMF nodes than are licensed with AMF Plus:*

- *AMF Plus will still be enabled in Vista Manager EX (provided there is no AMF license)*
- *any AMF nodes above the license count won't join the AMF network.*

The AMF Plus menu replaces the AOI menu in Vista Manager EX when all the AMF Masters and Controllers have:

- An AMF Plus Controller/Master license on all Masters and Controllers, and
- No AMF Controller/Master licenses applied, or AMF Controller/Master licenses disabled with this command.

Example To set the AMF network to only count AMF Plus licensed nodes, use the commands:

```
awplus#configure terminal
awplus(config)#atmf amfplus-license-only
```


Output The following shows typical output.

Example using atmf amfplus-license-only

```
ATMF Summary Information:
ATMF Status           : Enabled
Network Name          : gtnet
Node Name              : node2
Role                   : Master
Restricted login        : Enabled
Secure Mode            : Disabled
Current ATMF Guests    : 0
Current ATMF Nodes     : 10
Total number of licensed nodes available is 22

node2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
node2(config)#atmf amfplus-license-only
node2(config)#15:41:36 node2 ATMF[1041]: The number of nodes
allowed on this ATMF network is 12

node2(config)#do show atmf
ATMF Summary Information:

ATMF Status           : Enabled
Network Name          : gtnet
Node Name              : node2
Role                   : Master
Restricted login        : Enabled
Secure Mode            : Disabled
Current ATMF Guests    : 0
Current ATMF Nodes     : 10
Master is configured to allow only AMFPLUS Licenses
Total number of licensed nodes available is 12
```

Related commands [show atmf](#)

Command changes Version 5.5.3-0.1: command added

atmf area

Overview This command creates an AMF area and gives it a name and ID number.

Use the **no** variant of this command to remove the AMF area.

This command is only valid on AMF controllers, master nodes and gateway nodes.

Syntax `atmf area <area-name> id <1-4094> [local]`
`no atmf area <area-name>`

Parameter	Description
<code><area-name></code>	The AMF area name. The area name can be up to 15 characters long. Valid characters are: a..zA..Z0..9-_ Names are case sensitive and must be unique within an AMF network. The name cannot be the word "local" or an abbreviation of the word "local" (such as "l", "lo" etc.).
<code><1-4094></code>	An ID number that uniquely identifies this area.
<code>local</code>	Set the area to be the local area. The local area contains the device you are configuring.

Mode Global Configuration

Usage notes This command enables you to divide your AMF network into areas. Each area is managed by at least one AMF master node. Each area can have up to 120 nodes, depending on the license installed on that area's master node.

The whole AMF network is managed by up to 8 AMF controllers. Each AMF controller can communicate with multiple areas. The number of areas supported on a controller depends on the license installed on that controller.

You must give each area in an AMF network a unique name and ID number.

Only one local area can be configured on a device. You must specify a local area on each controller, remote AMF master, and gateway node.

Example To create the AMF area named New-Zealand, with an ID of 1, and specify that it is the local area, use the command:

```
controller-1(config)# atmf area New-Zealand id 1 local
```

To configure a remote area named Auckland, with an ID of 100, use the command:

```
controller-1(config)# atmf area Auckland id 100
```

Related commands

- atmf area password**
- show atmf area**
- show atmf area summary**
- show atmf area nodes**
- switchport atmf-area link**

Command changes Version 5.5.1-2.1: area **id** maximum increased to 4094

atmf area password

Overview This command sets a password on an AMF area.

Use the **no** variant of this command to remove the password.

This command is only valid on AMF controllers, master nodes and gateway nodes. The area name must have been configured first.

Syntax atmf area <area-name> password [8] <password>
no atmf area <area-name> password

Parameter	Description
<area-name>	The AMF area name.
8	This parameter is displayed in show running-config output to indicate that it is displaying the password in encrypted form. You should not enter 8 on the CLI yourself.
<password>	The password is between 8 and 32 characters long. It can include spaces.

Mode Global Configuration

Usage notes You must configure a password on each area that an AMF controller communicates with, except for the controller's local area. The areas must already have been created using the **atmf area** command.

Enter the password identically on both of:

- the area that locally contains the controller, and
- the remote AMF area masters

The command **show running-config atmf** will display the encrypted version of this password. The encryption keys will match between the controller and the remote AMF master.

If multiple controller and masters exist in an area, they must all have the same area configuration.

Example To give the AMF area named *Auckland* a password of "secure#1" use the following command on the controller:

```
controller-1(config)# atmf area Auckland password secure#1
```

and also use the following command on the master node for the Auckland area:

```
auck-master(config)# atmf area Auckland password secure#1
```

Related commands

- atmf area**
- show atmf area**
- show atmf area summary**
- show atmf area nodes**
- switchport atmf-area link**

atmf authorize

Overview On an AMF network, with secure mode enabled, use this command on an AMF master to authorize an AMF node to join the network. AMF nodes waiting to be authorized appear in the pending authorization queue, which can be examined using the [show atmf authorization](#) command with the **pending** parameter.

Use the **no** variant of this command to revoke authorization for an AMF node on an AMF master.

Syntax `atmf authorize {<node-name> [area <area-name>]|all-pending}`
`no atmf authorize <node-name> [area <area-name>]`

Parameter	Description
<node-name>	The name of the node to be authorized or have its authorization revoked.
area	Specify an AMF area.
<area-name>	This is the name of the area the node belongs to.
all-pending	Authorize all nodes in the pending queue.

Mode Privileged Exec

Usage notes On an AMF controller, AMF remote-area masters must be authorized by the controller, and the AMF remote-area masters will also need to authorized access from the AMF controller.

Example To authorize all AMF nodes in the pending authorization queue on an AMF master, use the command:

```
awplus# atmf authorize all-pending
```

To authorize a node called "node2" in remote AMF area "area3", use the command:

```
awplus# atmf authorize node2 area "area3"
```

To authorize a node called "node4" on an AMF master, use the command:

```
awplus# atmf authorize node4
```

To revoke authorization for a node called "node4" on an AMF master, use the command:

```
awplus# no atmf authorize node4
```

Related commands

- atmf secure-mode**
- clear atmf secure-mode certificates**
- show atmf authorization**
- show atmf secure-mode**
- show atmf secure-mode certificates**
- show atmf secure-mode statistics**

Command changes Version 5.4.7-0.3: command added

atmf authorize provision

Overview Use this command from an AMF controller or AMF master to pre-authorize a node on an AMF network running in secure mode. This allows a node to join the AMF network the moment the **atmf secure-mode** command is run on that node.

Use the **no** variant of this command to remove a provisional authorization from an AMF controller or AMF master.

Syntax

```
atmf authorize provision [timeout <minutes>] node <node-name>  
    interface <interface-name> [area <area-name>]  
atmf authorize provision [timeout <minutes>] mac <mac-address>  
atmf authorize provision [timeout <minutes>] all  
no atmf authorize provision node <node-name> interface  
    <interface-name> [area <area-name>]  
no atmf authorize provision mac <mac-address>  
no atmf authorize provision all
```

Parameter	Description
timeout	Timeout for provisional authorization. Authorization for provisioned nodes expires after the timeout period specified.
<minutes>	Timeout in minutes. A value between 1 and 6000 is permissible with the default being 60 minutes.
node	Specify a node to provision by node name.
<node-name>	The name of the node to provisionally authorize.
interface	Specify the interface the node will connect on.
<interface-name>	The name of the interface, this can be a switchport, link aggregator, LACP link, or virtual link.
area	Specify the AMF area.
<area-name>	This is the name of the area the node belongs to.
mac	Specify a node to provision by MAC address.
<mac-address>	Enter a MAC address to provisionally authorize in the format HHHH.HHHH.HHHH.
all	Provision authorization for all secure mode capable nodes.

Default The default timeout is 60 minutes.

Mode Privileged Exec

Example To provisionally authorize all non-secure AMF nodes, use the command:

```
awplus# atmf authorize provision all
```

To authorize a node with a MAC address of 0000.cd28.0880 for 2 hours, use the command:

```
awplus# authorize provision timeout 120 mac 0000.cd28.0880
```

To remove all provisional authorization, on an AMF master, use the command:

```
awplus# no atmf authorize provision all
```

Related commands [show atmf authorization](#)
[show atmf secure-mode](#)

Command changes Version 5.4.7-0.3: command added

atmf backup

Overview This command can only be applied to a master node. It manually schedules an AMF backup to start at a specified time and to execute a specified number of times per day.

Use the **no** variant of this command to disable the schedule.

Syntax `atmf backup {default|<hh:mm> frequency <1-24>}`

Parameter	Description
default	Restore the default backup schedule.
<hh:mm>	Sets the time of day to apply the first backup, in hours and minutes. Note that this parameter uses the 24 hour clock.
backup	Enables AMF backup to external media.
frequency <1-24>	Sets the number of times within a 24 hour period that backups will be taken.

Default Backups run daily at 03:00 AM, by default

Mode Global Configuration

Usage notes Running this command only configures the schedule. To enable the schedule, you should then apply the command **atmf backup enable**.

We recommend using the ext3 or ext4 filesystem on external media that are used for AMF backups.

Example To schedule backup requests to begin at 11 am and execute twice per day (11 am and 11 pm), use the following command:

```
node_1# configure terminal
```

```
node_1(config)# atmf backup 11:00 frequency 2
```



CAUTION: File names that comprise identical text, but with differing case, such as *Test.txt* and *test.txt*, will not be recognized as being different on FAT32 based backup media such as a USB storage device. However, these filenames will be recognized as being different on your Linux based device. Therefore, for good practice, ensure that you apply a consistent case structure for your back-up file names.

Related commands **atmf backup enable**
atmf backup stop
show atmf backup

atmf backup area-masters delete

Overview Use this command to delete from external media, a backup of a specified node in a specified area.

Note that this command can only be run on an AMF controller.

Syntax `atmf backup area-masters delete area <area-name> node <node-name>`

Parameter	Description
<area-name>	The area that contains the node whose backup will be deleted.
<node-name>	The node whose backup will be deleted.

Mode Privileged Exec

Example To delete the backup of the remote area-master named “well-gate” in the AMF area named Wellington, use the command:

```
controller-1# atmf backup area-masters delete area wellington  
node well-gate
```

Related commands [show atmf backup area](#)

atmf backup area-masters enable

Overview Use this command to enable backup of remote area-masters from the AMF controller. This command is only valid on AMF controllers.

Use the **no** form of the command to stop backups of remote area-masters.

Syntax atmf backup area-masters enable
no atmf backup area-masters enable

Mode Global configuration

Default Remote area backups are disabled by default

Usage notes Use the following commands to configure the remote area-master backups:

- **atmf backup** to configure when the backups begin and how often they run
- **atmf backup server** to configure the backup server.

We recommend using the ext3 or ext4 filesystem on external media that are used for AMF backups.

Example To enable scheduled backups of AMF remote area-masters, use the commands:

```
controller-1# configure terminal
controller-1(config)# atmf backup area-masters enable
```

To disable scheduled backups of AMF remote area-masters, use the commands:

```
controller-1# configure terminal
controller-1(config)# no atmf backup area-masters enable
```

Related commands **atmf backup server**
atmf backup
show atmf backup area

atmf backup area-masters now

Overview Use this command to run an AMF backup of one or more remote area-masters from the AMF controller immediately.

This command is only valid on AMF controllers.

Syntax `atmf backup area-masters now [area <area-name>|area <area-name> node <node-name>]`

Parameter	Description
<area-name>	The area whose area-masters will be backed up.
<node-name>	The node that will be backed up.

Mode Privileged Exec

Example To back up all local master nodes in all areas controlled by controller-1, use the command

```
controller-1# atmf backup area-masters now
```

To back up all local masters in the AMF area named Wellington, use the command

```
controller-1# atmf backup area-masters now area Wellington
```

To back up the local master "well-master" in the Wellington area, use the command

```
controller-1# atmf backup area-masters now area Wellington node well-master
```

Related commands [atmf backup area-masters enable](#)
[atmf backup area-masters synchronize](#)
[show atmf backup area](#)

atmf backup area-masters synchronize

Overview Use this command to synchronize backed-up area-master files between the active remote file server and the backup remote file server. Files are copied from the active server to the remote server.

Note that this command is only valid on AMF controllers.

Syntax atmf backup area-masters synchronize

Mode Privileged Exec

Example To synchronize backed-up files between the remote file servers for all area-masters, use the command:

```
controller-1# atmf backup area-masters synchronize
```

Related commands [atmf backup area-masters enable](#)
[atmf backup area-masters now](#)
[show atmf backup area](#)

atmf backup bandwidth

Overview This command sets the maximum bandwidth in kilobytes per second (kBps) available to the AMF backup process. This command enables you to restrict the bandwidth that is utilized for downloading file contents during a backup.

NOTE: *This command will only run on an AMF master. An error message will be generated if the command is attempted on node that is not a master.*

Also note that setting the bandwidth value to zero will allow the transmission of as much bandwidth as is available, which can exceed the maximum configurable speed of 1000 kBps. In effect, zero means unlimited.

Use the **no** variant of this command to reset (to its default value of zero) the maximum bandwidth in kilobytes per second (kBps) available when initiating an AMF backup. A value of zero tells the backup process to transfer files using unlimited bandwidth.

Syntax atmf backup bandwidth <0-1000>
no atmf backup bandwidth

Parameter	Description
<0-1000>	Sets the bandwidth in kilobytes per second (kBps)

Default The default value is zero, allowing unlimited bandwidth when executing an AMF backup.

Mode Global Configuration

Examples To set an atmf backup bandwidth of 750 kBps, use the commands:

```
node2# configure terminal
node2(config)# atmf backup bandwidth 750
```

To set the AMF backup bandwidth to the default value for unlimited bandwidth, use the commands:

```
node2# configure terminal
node2(config)# no atmf backup bandwidth
```

Related commands [show atmf backup](#)

atmf backup delete

Overview This command removes the backup file from the external media of a specified AMF node.

Note that this command can only be run from an AMF master node.

Syntax atmf backup delete <node-name>

Parameter	Description
<node-name>	The AMF node name of the backup file to be deleted.

Mode Privileged Exec

Example To delete the backup file from node2, use the following command:

```
Node_1# atmf backup delete node2
```

Related commands

- [show atmf backup](#)
- [atmf backup now](#)
- [atmf backup stop](#)

atmf backup enable

Overview This command enables automatic AMF backups on the AMF master node that you are connected to. By default, automatic backup starts at 3:00 AM. However, this schedule can be changed by the **atmf backup**. Note that backups are initiated and stored only on the master nodes.

Use the **no** variant of this command to disable any AMF backups that have been scheduled and previously enabled.

Syntax atmf backup enable
no atmf backup enable

Default Automatic AMF backup functionality is enabled on the AMF master when it is configured and external media, i.e. an SD card or a USB storage device or remote server, is detected.

Mode Global Configuration

Usage notes A warning message will appear if you run the **atmf backup enable** command with either insufficient or marginal memory availability on your external storage device.

You can use the command **show atmf backup** to check the amount of space available on your external storage device.

We recommend using the ext3 or ext4 filesystem on external media that are used for AMF backups.

Example To turn on automatic AMF backup, use the following command:

```
AMF_Master_1# configure terminal
AMF_Master_1(config)# atmf backup enable
```

Related commands **show atmf**
show atmf backup
atmf backup
atmf backup now
atmf enable

atmf backup guests delete

Overview This command removes a guest node's backup files from external media such as a USB drive, SD card, or an external file server.

Syntax `atmf backup guests delete <node-name> <guest-port>`

Parameter	Description
<code><node-name></code>	The name of the guest's parent node.
<code><guest-port></code>	The port number on the parent node.

Mode User Exec/Privileged Exec

Example On a parent node named "node1" (which, in this case, the user has a direct console connection to) use the following command to remove the backup files of the guest node that is directly connected to port1.0.3.

```
node1# atmf backup guests delete node1 port1.0.3
```

Related Command [atmf backup delete](#)
[atmf backup area-masters delete](#)
[show atmf backup guest](#)

atmf backup guests enable

Overview Use this command to enable backups of remote guest nodes from an AMF master.

Use the **no** variant of this command to disable the ability of the guest nodes to be backed up.

Syntax atmf backup guests enable
no atmf backup guests enable

Default Guest node backups are enabled by default.

Mode Global Config

Usage notes We recommend using the ext3 or ext4 filesystem on external media that are used for AMF backups.

Example On the AMF master node, enable all scheduled guest node backups:

```
atmf-master# configure terminal
atmf-master(config)# atmf backup guests enable
```

Related commands **atmf backup area-masters enable**
show atmf backup guest
atmf backup guests synchronize

atmf backup guests now

Overview This command manually triggers an AMF backup of guest nodes on a AMF Master.

Syntax atmf backup guests now [*<node-name>*] [*<guest-port>*]

Parameter	Description
<i><node-name></i>	The name of the guest's parent node.
<i><guest-port></i>	The port number that connects to the guest node.

Default n/a

Mode Privileged Exec

Example Use the following command to manually trigger the backup of all guests in the AMF network

```
awplus# atmf backup guests now
```

Example To manually trigger the backup of a guest node connected to port 1.0.23 of node1, use the following command:

```
awplus# atmf backup guests now node1 port1.0.23
```

Related commands [show atmf backup guest](#)

atmf backup guests synchronize

Overview This command initiates a manual synchronization of all guest backup file-sets across remote file servers and various redundancy backup media, such as USB storage devices. This facility ensures that each device contains the same backup image files. Note that this backup synchronization process will occur as part of the regular backups scheduled by the **atmf backup** command.

Syntax atmf backup guests synchronize

Default n/a

Mode User Exec/Privileged Exec

Example To synchronize backups across remote file servers and storage devices, use the command:

```
Node1#atmf backup guests synchronize
```

Related commands **atmf backup redundancy enable**

show atmf guests

atmf backup guests enable

atmf backup now

Overview This command initiates an immediate AMF backup of either all AMF members, or a selected AMF member. Note that this backup information is stored in the external media on the master node of the device on which this command is run, even though the selected AMF member may not be a master node.

Note that this command can only be run on an AMF master node.

Syntax atmf backup now [<nodename>]

Parameter	Description
<nodename> or <hostname>	The name of the AMF member to be backed up, as set by the command hostname . Where no name has been assigned to this device, then you must use the default name, which is the word "host", then an underscore, then (without a space) the MAC address of the device to be backed up. For example host_0016_76b1_7a5e. Note that the node-name appears as the command Prompt when in Privileged Exec mode.

Default A backup is initiated for all nodes on the AMF (but stored on the master nodes).

Mode Privileged Exec

Usage notes Although this command will select the AMF node to be backed-up, it can only be run from any AMF master node.

NOTE: The backup produced will be for the selected node but the backed-up config will reside on the external media of the AMF master node on which the command was run. However, this process will result in the information on one master being more up-to-date. To maintain concurrent backups on both masters, you can apply the backup now command to the master working-set. This is shown in Example 4 below.

Example 1 In this example, an AMF member has not been assigned a host name. The following command is run on the AMF_Master_2 node to immediately backup the device that is identified by its MAC address of 0016.76b1.7a5e:

```
AMF_Master_2# atmf backup now host_0016_76b1_7a5e
```

NOTE: When a host name is derived from its MAC address, the syntax format entered changes from XXXX.XXXX.XXXX to XXXX_XXXX_XXXX.

Example 2 In this example, an AMF member has the host name, **office_annex**. The following command will immediately backup this device:

```
AMF_Master_2# atmf backup now office_annex
```

This command is initiated on the device's master node named **AMF_Master_2** and initiates an immediate backup on the device named **office_annex**.

Example 3 To initiate from AMF_master_1 an immediate backup of all AMF member nodes, use the following command:

```
AMF_Master_1# amf backup now
```

Example 4 To initiate an immediate backup of the node with the host-name "office_annex" and store the configuration on both masters, use the following process:

From the AMF_master_1, set the working-set to comprise only of the automatic group, master nodes.

```
AMF_Master_1# atmf working-set group master
```

This command returns the following display:

```
=====
AMF_Master_1, AMF_Master_2
=====

Working set join
```

Backup the AMF member with the host name, **office_annex** on both the master nodes as defined by the working set.

```
AMF_Master[2]# atmf backup now office_annex
```

Note that the [2] shown in the command prompt indicates a 2 node working-set.

Related commands

- atmf backup**
- atmf backup stop**
- hostname**
- show atmf backup**

atmf backup redundancy enable

Overview This command is used to enable or disable AMF backup redundancy.

Syntax atmf backup redundancy enable
no atmf backup redundancy enable

Default Disabled

Mode Global Configuration

Usage notes If the AMF Master or Controller supports any removable media (SD card/USB), it uses the removable media as the redundant backup for the AMF data backup.

This feature is valid only if remote file servers are configured on the AMF Master or Controller.

We recommend using the ext3 or ext4 filesystem on external media that are used for AMF backups.

Example To enable AMF backup redundancy, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# atmf backup redundancy enable
```

To disable AMF backup redundancy, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no atmf backup redundancy enable
```

Related commands [atmf backup synchronize](#)
[show atmf backup](#)
[show atmf backup area](#)

atmf backup server

Overview This command configures remote file servers as the destination for AMF backups.

Use the **no** variant of this command to remove the destination server(s). When all servers are removed the system will revert to backup from external media.

Syntax `atmf backup server id {1|2} <hostlocation> username <username> [path <path>|port <1-65535>]`
`no atmf backup server id {1|2}`

Parameter	Description
id	Remote server backup server identifier.
{1|2}	The backup server identifier number (1 or 2). Note that there can be up to two backup servers, numbered 1 and 2 respectively, and you would need to run this command separately for each server.
<hostlocation>	Either the name or the IP address (IPv4 or IPv6) of the selected backup server (1 or 2).
username	Configure the username to log in with on the selected remote file server.
<username>	The selected remote file server's username.
path	The location of the backup files on the selected remote file server. By default this will be the home directory of the username used to log in with.
<path>	The directory path utilized to store the backup files on the selected remote file server. No spaces are allowed in the path.
port	The connection to the selected remote backup file server using SSH. By default SSH connects to a device on TCP port 22 but this can be changed with this command.
<1-65535>	A TCP port within the specified range.

Defaults Remote backup servers are not configured. The default SSH TCP port is 22. The path utilized on the remote file server is the home directory of the username.

Mode Global Exec

Usage notes The hostname and username parameters must both be configured.

Examples To configure server 1 with an IPv4 address and a username of *backup1*, use the commands:

```
AMF_Master_1# configure terminal
```

```
AMF_Master_1(config)# atmf backup server id 1 192.168.1.1  
username backup1
```

To configure server 1 with an IPv6 address and a username of *backup1*, use the command:

```
AMF_backup1_1# configure terminal
```

```
AMF_Master_1(config)# atmf backup server id 1 FFEE::01 username  
backup1
```

To configure server 2 with a hostname and username, use the command:

```
AMF_Master_1# configure terminal
```

```
AMF_Master_1(config)# atmf backup server id 2 www.example.com  
username backup2
```

To configure server 2 with a hostname and username in addition to the optional path and port parameters, use the command:

```
AMF_Master_1# configure terminal
```

```
AMF_Master_1(config)# atmf backup server id 2 www.example.com  
username backup2 path tokyo port 1024
```

To unconfigure the AMF remote backup file server 1, use the command:

```
AMF_Master_1# configure terminal
```

```
AMF_Master_1(config)# no atmf backup server id 1
```

Related commands [show atmf backup](#)

atmf backup stop

Overview Running this command stops a backup that is currently running on the master node you are logged onto. Note that if you have two masters and want to stop both, then you can either run this command separately on each master node, or add both masters to a working set, and issue this command to the working set.

Note that this command can only be run on a master node.

Syntax `atmf backup stop`

Mode Privileged Exec

Usage notes This command is used to halt an AMF backup that is in progress. In this situation the backup process will finish on its current node and then stop.

Example To stop a backup that is currently executing on master node node-1, use the following command:

```
AMF_Master_1# amf backup stop
```

Related commands

- [atmf backup](#)
- [atmf backup enable](#)
- [atmf backup now](#)
- [show atmf backup](#)

atmf backup synchronize

Overview For the master node you are connected to, this command initiates a system backup of files from the node's active remote file server to its backup remote file server. Note that this process happens automatically each time the network is backed up.

Note that this command can only be run from a master node.

Syntax atmf backup synchronize

Mode Privileged Exec

Example When connected to the master node AMF_Master_1, the following command will initiate a backup of all system related files from its active remote file server to its backup remote file server.

```
AMF_Master_1# atmf backup synchronize
```

Related commands

- [atmf backup enable](#)
- [atmf backup redundancy enable](#)
- [show atmf](#)
- [show atmf backup](#)

atmf cleanup

Overview This command is an alias to the **erase factory-default** command.

atmf container

Overview Use this command to create or update an AMF container on a Virtual AMF Appliance (VAA) virtual machine.

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Use the **no** variant of this command to remove an AMF container.

Syntax `atmf container <container-name>`
`no atmf container <container-name>`

Parameter	Description
<code><container-name></code>	The name of the AMF container to create, update, or remove.

Mode AMF Container Configuration

Usage notes You cannot delete a container while it is still running. First use the **state disable** command to stop the container.

Examples To create or update the AMF container “vac-wlg-1”, use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)#
```

To remove the AMF container “vac-wlg-1”, use the commands:

```
awplus# configure terminal
awplus(config)# no atmf container vac-wlg-1
```

Related commands [area-link](#)
[atmf container login](#)
[bridge-group \(amf-container\)](#)
[description \(amf-container\)](#)
[show atmf container](#)
[state](#)

Command changes Version 5.4.7-0.1: command added

atmf container login

Overview Use this command to login to an AMF container on a Virtual AMF Appliance (VAA).

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Syntax atmf container login <container-name>

Parameter	Description
<container-name>	The name of the AMF container you wish to login into.

Mode Privileged Exec

Usage notes If you try to login to a AMF container that has not been created, or is not running, you will see the following message:

% Container does not exist or is not running.

To exit from a container and return to the host VAA press <Ctrl+a q>.

Example To login to container "vac-wlg-1", use the command:

```
awplus# atmf container login vac-wlg-1
```

You will then be presented with a login screen for that container:

```
Connected to tty 1
Type <Ctrl+a q> to exit the console, <Ctrl+a Ctrl+a> to enter Ctrl+a itself

vac-wlg-1 login: manager
Password: friend

AlliedWare Plus (TM) 5.4.7 02/03/17 08:46:12

vac-wlg-1>
```

Related commands [atmf container](#)
[show atmf container](#)

Command changes Version 5.4.7-0.1: command added

atmf controller

Overview Use this command to configure the device as an AMF controller. This enables you to split a large AMF network into multiple areas.

AMF controller is a licensed feature. The number of areas supported on a controller depends on the license installed on that controller.

Use the **no** variant of this command to remove the AMF controller functionality.

Syntax atmf controller
no atmf controller

Mode Global configuration

Usage notes If a valid AMF controller license is not available on the device, the device will accept this command but will not act as a controller until you install a valid license. The following message will warn you of this:

"An AMF Controller license must be installed before this feature will become active"

NOTE: *If the AMF controller functionality is removed from a device using the command then the device must be rebooted if it is to function properly as an AMF master.*

Example To configure the node named *controller-1* as an AMF controller, use the commands:

```
controller-1# configure terminal
controller-1(config)# atmf controller
```

To stop the node named *controller-1* from being an AMF controller, use the commands:

```
controller-1# configure terminal
controller-1(config)# no atmf controller
```

Related commands [atmf area](#)
[show atmf](#)

atmf distribute firmware

Overview This command can be used to upgrade software one AMF node at a time. A URL can be selected from any media location. The latest compatible release for a node will be selected from this location.

Several procedures are performed to ensure the upgrade will succeed. This includes checking the current node release boots from flash. If there is enough space on flash, the software release is copied to flash on the new location.

The new release name is updated using the **boot system** command. The old release will become the backup release file. If a release file exists in a remote device (such as TFTP or HTTP, for example) then the URL should specify the exact release filename without using a wild card character.

The command will continue to upgrade software until all nodes are upgraded. At the end of the upgrade cycle the command should be used on the working-set.

Syntax atmf distribute firmware <filename>

Parameter	Description
<filename>	The filename and path of the file. See the File Management Feature Overview and Configuration Guide for valid syntax.

Mode Privileged Exec

Examples To upgrade nodes in a AMF network with a predefined AMF group called 'teams', use the following command:

Team1# atmf working-set group teams

```
=====
Team1, Team2, Team3:
=====
Working set join
```

ATMF_NETWORK[3]# atmf distribute firmware card:*.rel

```
Retrieving data from Team1
Retrieving data from Team2
Retrieving data from Team3

ATMF Firmware Upgrade:

Node Name           New Release File           Status
-----
Team1                x510-5.4.7-1.1.rel         Release ready
Team2                x930-5.4.7-1.1.rel         Release ready
Team3                x930-5.4.7-1.1.rel         Release ready
Continue the rolling reboot ? (y/n):y
=====
Copying Release      : x510-5.4.7-1.1.rel to Team1
Updating Release     : x510-5.4.7-1.1.rel information on Team1
=====
Copying Release      : x930-5.4.7-1.1.rel to Team2
Updating Release     : x930-5.4.7-1.1.rel information on Team2
=====
Copying Release      : x930-5.4.7-1.1.rel to Team3
Updating Release     : x930-5.4.7-1.1.rel information on Team3
=====
New firmware will not take effect until nodes are rebooted.
=====

ATMF_NETWORK[3]#
```

Related [atmf working-set commands](#)

atmf domain vlan

Overview The AMF domain VLAN is created when the AMF network is first initiated and is assigned a default VID of 4091. This command enables you to change the VID from this default value on this device.

The AMF domain VLAN is one of AMF's internal VLANs (the management VLAN is the other internal VLAN). AMF uses these internal VLANs to communicate network status information between nodes. These VLANs must be reserved for AMF and not used for other purposes.

An important point conceptually is that although the domain VLAN exists globally across the AMF network, it is assigned separately to each domain. The AMF network therefore can be thought of as comprising a series of domain VLANs each having the same VID and each being applied to a horizontal slice (domain) of the AMF. It follows therefore that the domain VLANs are only applied to ports that form cross-links and not to ports that form uplinks/downlinks.



CAUTION: Every member of your AMF network must have the same domain VLAN, management VLAN, and management subnet.



CAUTION: If you change the domain VLAN, management VLAN, or management subnet of a node, that change takes effect immediately and the node will immediately leave the AMF network and try to rejoin it. The AMF network will not be complete until you have given all devices the same setting, so they can all rejoin the AMF network.

Use the **no** variant of this command to reset the VLAN ID to its default value of 4091.

Syntax atmf domain vlan <2-4090>
no atmf domain vlan

Parameter	Description
<2-4090>	The VLAN number in the range 2 to 4090.

Default VLAN 4091

Mode Global Configuration

Usage notes We recommend you only change the domain VLAN when first creating the AMF network, and only if VLAN 4091 is already being used in your network.

However, if you do need to change the VLAN on an existing AMF network, use the following steps:

1. Create a working set of the whole of your AMF network, using the commands:

```
master# atmf working-set group all
```

You must use **working-set group all** if changing the domain VLAN. If you use a different working-set, nodes that are not in that working-set will lose contact with the AMF network.

2. The prompt will display the number of nodes in the AMF network. Record this number. In this example, the network is named "test" and has 10 nodes:

```
test[10]#
```

3. Enter the new VLAN ID, using the commands:

```
test[10]# configure terminal
```

```
test(config)[10]# atmf domain vlan <2-4090>
```

The nodes will execute the command in parallel, leave the AMF network, and attempt to rejoin through the new VLAN.

4. Create the working set again, using the commands:

```
master(config)# exit
```

```
master# atmf working-set group all
```

5. Save the configuration, using the command:

```
test[10]# write
```

6. The prompt will display the number of nodes in the AMF network. Check that this is the same as the number in step 1. If it is not, you will need to change the VLAN on missing devices by logging into their consoles directly.

NOTE: *The domain VLAN will automatically be assigned an IP subnet address based on the value configured by the command .*

The default VLAN ID lies outside the user-configurable range. If you need to reset the VLAN to the default VLAN ID, use the **no** variant of this command to do so.

Examples To change the AMF domain VLAN to 4090 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# atmf domain vlan 4090
master(config)# exit
master# atmf working-set group all
test[10]# write
```

To reset the AMF domain VLAN to its default of 4091 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# no atmf domain vlan
master(config)# exit
master# atmf working-set group all
test[10]# write
```

Related commands [atmf management subnet](#)
[atmf management vlan](#)

atmf enable

Overview This command manually enables (turns on) the AMF feature for the device being configured.

Use the **no** variant of this command to disable (turn off) the AMF feature on the member node.

Syntax atmf enable
no atmf enable

Default Once AMF is configured, the AMF feature starts automatically when the device starts up.

Mode Global Configuration

Usage notes The device does not auto negotiate AMF domain specific settings such as the Network Name. You should therefore, configure your device with any domain specific (non default) settings before enabling AMF.

Examples To turn off AMF, use the command:

```
MyNode# config terminal
MyNode(config)# no atmf enable
```

To turn on AMF, use the command:

```
MyNode(config)# atmf enable
```

This command returns the following display:

```
% Warning: The ATMF network config has been set to enable
% Save the config and restart the system for this change to take
effect.
```


atmf group (membership)

Overview This command configures a device to be a member of one or more AMF groups. Groups exist in three forms: Implicit Groups, Automatic Groups, and User-defined Groups.

- Implicit Groups
 - all: All nodes in the AMF
 - current: The current working-set
 - local: The originating node.

Note that the Implicit Groups do not appear in show group output.

- Automatic Groups - These are defined by hardware architecture, e.g. x510, x230, x8100, AR3050S, AR4050S.
- User-defined Groups - These enable you to define arbitrary groups of AMF members based on your own criteria.

Each node in the AMF is automatically assigned membership to the implicit groups, and the automatic groups that are appropriate to its node type, e.g. x230, PoE. Similarly, nodes that are configured as masters are automatically assigned to the master group.

Use the **no** variant of this command to remove the membership.

Syntax atmf group *<group-list>*
no atmf group *<group-list>*

Parameter	Description
<i><group-list></i>	A list of group names. These should be entered as a comma delimited list without spaces. Names can contain alphanumeric characters, hyphens and underscores.

Mode Global Configuration

Usage notes You can use this command to define your own arbitrary groups of AMF members based on your own network's configuration requirements. Applying a node to a non existing group will result in the group automatically being created.

Note that the master nodes are automatically assigned to be members of the pre-existing master group.

The following example configures the device to be members of three groups; two are company departments, and one comprises all devices located in building_2. To avoid having to run this command separately on each device that is to be added to these groups, you can remotely assign all of these devices to a working-set, then use the capabilities of the working-set to apply the **atmf group (membership)** command to all members of the working set.

Example 1 To specify the device to become a member of AMF groups named *marketing*, *sales*, and *building_2*, use the following commands:

```
node-1# configure terminal
node-1(config)# atmf group marketing,sales,building_2
```

Example 2 To add the nodes *member_node_1* and *member_node_2* to groups *building1* and *sales*, first add the nodes to the working-set:

```
master_node# atmf working-set member_node_1,member_node_2
```

This command returns the following output confirming that the nodes *member_node_1* and *member_node_2* are now part of the working-set:

```
=====
member_node_1, member_node_2
=====

Working set join
```

Then add the members of the working set to the groups:

```
atmf-net[2]# configure terminal
atmf-net[2](config)# atmf group building1,sales
atmf-net[2](config)# exit
atmf-net[2]# show atmf group
```

This command returns the following output displaying the groups that are members of the working-set.

```
=====
member_node_1
=====

AMF group information
building1, sales
```

Related commands [show atmf group](#)
[show atmf group members](#)

atmf guest-class

Overview This modal command creates a guest-class. Guest-classes are modal templates that can be applied to selected guest types. Once you have created a guest-class, you can select it by entering its mode. From here, you can then configure a further set of operational settings specifically for the new guest-class.

These settings can then all be applied to a guest link by running the **switchport atmf-guestlink** command. The following settings can be configured from each guest class mode:

- discovery method
- model type
- http-enable setting
- guest port, user name, and password

The **no** variant of this command removes the guest-class. Note that you cannot remove a guest-class that is assigned to a port.

Syntax `atmf guest-class <guest-class-name>`
`no atmf guest-class <guest-class-name>`

Parameter	Description
<code><guest-class-name></code>	The name assigned to the guest-class type. This can be chosen from an arbitrary string of up to 15 characters.

Mode Global Configuration

Example To create a guest-class named 'camera' use the commands:

```
node1# configure terminal
node1(config)# atmf guest-class camera
node1(config-atmf-guest)#
```

To remove the guest-class named 'camera' use the commands:

```
node1# configure terminal
node1(config)# no atmf guest-class camera
```

Related commands [show atmf area guests](#)
[discovery](#)
[firmware-url](#)
[http-enable](#)

username (atmf-guest)

modeltype

switchport atmf-guestlink

show atmf links guest

show atmf guests

login-fallback enable

atmf log-verbose

Overview This command limits the number of log messages displayed on the console or permanently logged.

Use the **no** variant of this command to reset to the default.

Syntax atmf log-verbose <1-3>
no atmf log-verbose

Parameter	Description
<1-3>	The verbose limitation (3 = noisiest, 1 = quietest)

Default The default log display is 3.

Usage This command is intended for use in large networks where verbose output can make the console unusable for periods of time while nodes are joining and leaving.

Mode Global Configuration

Example To set the log-verbose to noise level 2, use the command:

```
node-1# configure terminal
node-1(config)# atmf log-verbose 2
```

Validation Command **show atmf**

atmf management subnet

Overview This command is used to assign a subnet that will be allocated to the AMF management and domain management VLANs. From the address space defined by this command, two subnets are created, a management subnet component and a domain component, as explained in the Usage section below.

AMF uses these internal IPv4 subnets to communicate network status information between nodes. These subnet addresses must be reserved for AMF and not used for other purposes.



CAUTION: Every member of your AMF network must have the same domain VLAN, management VLAN, and management subnet.



CAUTION: If you change the domain VLAN, management VLAN, or management subnet of a node, that change takes effect immediately and the node will immediately leave the AMF network and try to rejoin it. The AMF network will not be complete until you have given all devices the same setting, so they can all rejoin the AMF network.

Use the **no** variant of this command to remove the assigned subnet.

Syntax atmf management subnet <a.b.0.0>
no atmf management subnet

Parameter	Description
<a.b.0.0>	The IP address selected for the management subnet. Because a mask of 255.255.0.0 (i.e. /16) will be applied automatically, an IP address in the format a.b.0.0 must be selected. Usually this subnet address is selected from an appropriate range from within the private address space of 172.16.0.0 to 172.31.255.255, or 192.168.0.0, as defined in RFC1918.

Default 172.31.0.0. A subnet mask of 255.255.0.0 will automatically be applied.

Mode Global Configuration

Usage notes Running this command will result in the creation of a further two subnets (within the class B address space assigned) and the mask will extend from /16 to /17.

For example, if the management subnet is assigned the address 172.31.0.0/16, this will result in the automatic creation of the following two subnets:

- 172.31.0.0/17 assigned to the **atmf management vlan**
- 172.31.128.0/17 assigned to the **atmf domain vlan**.

We recommend you only change the management subnet when first creating the AMF network, and only if 172.31.0.0 is already being used in your network.

However, if you do need to change the subnet on an existing AMF network, use the following steps:

1. Create a working set of the whole of your AMF network, using the commands:

```
master# atmf working-set group all
```

You must use **working-set group all** if changing the domain VLAN, management VLAN, or management subnet. If you use a different working-set, nodes that are not in that working-set will lose contact with the AMF network.

2. The prompt will display the number of nodes in the AMF network. Record this number. In this example, the network is named "test" and has 10 nodes:

```
test[10]#
```

3. Enter the new subnet address, using the commands:

```
test[10]# configure terminal
```

```
test(config)[10]# atmf management subnet <a.b.0.0>
```

The nodes will execute the command in parallel, leave the AMF network, and attempt to rejoin through the new subnet.

4. Create the working set again, using the commands:

```
master(config)# exit
```

```
master# atmf working-set group all
```

5. Save the configuration, using the command:

```
test[10]# write
```

6. The prompt will display the number of nodes in the AMF network. Check that this is the same as the number in step 1. If it is not, you will need to change the subnet on missing devices by logging into their consoles directly.

Examples To change the AMF management subnet address to 172.25.0.0 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# atmf management subnet 172.25.0.0
master(config)# exit
master# atmf working-set group all
test[10]# write
```

To reset the AMF management subnet address to its default of 172.31.0.0 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# no atmf management subnet
master(config)# exit
master# atmf working-set group all
test[10]# write
```

Related commands [atmf domain vlan](#)
[atmf management vlan](#)

atmf management vlan

Overview The AMF management VLAN is created when the AMF network is first initiated and is assigned a default VID of 4092. This command enables you to change the VID from this default value on this device.

The AMF management VLAN is one of AMF's internal VLANs (the domain VLAN is the other internal VLAN). AMF uses these internal VLANs to communicate network status information between nodes. These VLANs must be reserved for AMF and not used for other purposes.



CAUTION: Every member of your AMF network must have the same domain VLAN, management VLAN, and management subnet.



CAUTION: If you change the domain VLAN, management VLAN, or management subnet of a node, that change takes effect immediately and the node will immediately leave the AMF network and try to rejoin it. The AMF network will not be complete until you have given all devices the same setting, so they can all rejoin the AMF network.

Use the **no** variant of this command to restore the VID to the default of 4092.

Syntax atmf management vlan <2-4090>
no atmf management vlan

Parameter	Description
<2-4090>	The VID assigned to the AMF management VLAN.

Default VLAN 4092

Mode Global Configuration

Usage notes We recommend you only change the management VLAN when first creating the AMF network, and only if VLAN 4092 is already being used in your network.

However, if you do need to change the VLAN on an existing AMF network, use the following steps to ensure you change it on all nodes simultaneously:

1. Create a working set of the whole of your AMF network, using the commands:

```
master# atmf working-set group all
```

You must use **working-set group all** if changing the management VLAN. If you use a different working-set, nodes that are not in that working-set will lose contact with the AMF network.

2. The prompt will display the number of nodes in the AMF network. Record this number. In this example, the network is named "test" and has 10 nodes:

```
test[10]#
```

3. Enter the new VLAN ID, using the commands:

```
test[10]# configure terminal
```

```
test(config)[10]# atmf management vlan <2-4090>
```

The nodes will execute the command in parallel, leave the AMF network, and attempt to rejoin through the new VLAN.

4. Create the working set again, using the commands:

```
master(config)# exit
```

```
master# atmf working-set group all
```

5. Save the configuration, using the command:

```
test[10]# write
```

6. The prompt will display the number of nodes in the AMF network. Check that this is the same as the number in step 1. If it is not, you will need to change the VLAN on missing devices by logging into their consoles directly.

NOTE: *The management VLAN will automatically be assigned an IP subnet address based on the value configured by the command .*

The default VLAN ID lies outside the user-configurable range. If you need to reset the VLAN to the default VLAN ID, use the **no** variant of this command to do so.

Examples To change the AMF management VLAN to 4090 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# atmf management vlan 4090
master(config)# exit
master# atmf working-set group all
test[10]# write
```

To reset the AMF management VLAN to its default of 4092 in an existing AMF network, use the following commands:

```
master# atmf working-set group all
test[10]# configure terminal
test(config)[10]# no atmf management vlan
master(config)# exit
master# atmf working-set group all
test[10]# write
```

Related commands [atmf domain vlan](#)
[atmf management subnet](#)

atmf master

Overview This command configures the device to be an AMF master node and automatically creates an AMF master group. The master node is considered to be the core of the AMF network, and must be present for the AMF to form. The AMF master has its node depth set to 0. Note that the node depth vertical distance is determined by the number of uplinks/downlinks that exist between the node and its master.

An AMF master node must be present for an AMF network to form. Up to two AMF master nodes may exist in a network, and they **must** be connected by an AMF crosslink.

NOTE: Master nodes are an essential component of an AMF network. In order to run AMF, an AMF License is required for each master node.

If the crosslink between two AMF masters fails, then one of the masters will become isolated from the rest of the AMF network.

Use the **no** variant of this command to remove the device as an AMF master node. The node will retain its node depth of 0 until the network is rebooted.

NOTE: Node depth is the vertical distance (or level) from the master node (whose depth value is 0).

Syntax atmf master
no atmf master

Default The device is not configured to be an AMF master node.

Mode Global Configuration

Example To specify that this node is an AMF master, use the following command:

```
node-1# configure terminal
node-1(config)# atmf master
```

Related commands [show atmf](#)
[show atmf group](#)

atmf mtu

Overview This command configures the AMF network Maximum Transmission Unit (MTU). The MTU value will be applied to the AMF Management VLAN, the AMF Domain VLAN and AMF Area links.

Use the **no** variant of this command to restore the default MTU.

Syntax `atmf mtu <1300-1442>`
`no atmf mtu`

Parameter	Description
<1300-1442>	The value of the maximum transmission unit for the AMF network, which sets the maximum size of all AMF packets generated from the device.

Default 1300

Mode Global Configuration

Usage notes The default value of 1300 will work for all AMF networks (including those that involve virtual links over IPsec tunnels). If there are virtual links over IPsec tunnels anywhere in the AMF network, we recommend not changing this default. If there are no virtual links over IPsec tunnels, then this AMF MTU value may be increased for network efficiency.

Example To change the ATMF network MTU to 1442, use the command:

```
awplus(config)# atmf mtu 1442
```

Related commands [show atmf detail](#)

atmf network-name

Overview This command applies an AMF network name to a (prospective) AMF node. In order for an AMF network to be valid, its network-name must be configured on at least two nodes, one of which must be configured as a master and have an AMF License applied. These nodes may be connected using either AMF downlinks or crosslinks.

For more information on configuring an AMF master node, see the command **atmf master**.

Use the **no** variant of this command to remove the AMF network name.

Syntax atmf network-name <name>
no atmf network-name

Parameter	Description
<name>	The AMF network name. Up to 15 printable characters can be entered for the network-name.

Mode Global Configuration

Usage notes This is one of the essential commands when configuring AMF and must be entered on each node that is to be part of the AMF.

A switching node (master or member) may be a member of only one AMF network.

 **CAUTION:** Ensure that you enter the correct network name. Entering an incorrect name will cause the AMF network to fragment (at the next reboot).

Example To set the AMF network name to amf_net use the command:

```
Node_1(config)# atmf network-name amf_net
```

atmf provision (interface)

Overview This command configures a specified port on an AMF node to accept a provisioned node, via an AMF link, some time in the future.

Use the **no** variant of this command to remove the provisioning on the node.

Syntax `atmf provision <nodename>`

`no atmf provision`

Parameter	Description
<code><nodename></code>	The name of the provisioned node that will appear on the AMF network in the future.

Mode Interface Configuration for a switchport, a static aggregator, dynamic channel group or an Eth port on an AR-Series device.

Usage notes The port should be configured as an AMF link or cross link and should be 'down' to add or remove a provisioned node.

Example To provision an AMF node named node1 for port1.0.1, use the commands:

```
host1(config)# interface port1.0.1
host1(config-if)# atmf provision node1
```

Related commands

- `atmf provision node`
- `clone (amf-provision)`
- `configure boot config (amf-provision)`
- `configure boot system (amf-provision)`
- `copy (amf-provision)`
- `create (amf-provision)`
- `delete (amf-provision)`
- `identity (amf-provision)`
- `license-cert (amf-provision)`
- `locate (amf-provision)`
- `show atmf provision nodes`
- `show atmf links`
- `switchport atmf-link`
- `switchport atmf-crosslink`

atmf provision node

Overview Use this command to provision a replacement node for a specified interface. Node provisioning is effectively the process of creating a backup file-set on a master node that can be loaded onto a provisioned node some time in the future. This file-set is created just as if the provisioned node really existed and was connected to the network. Typically these comprise configuration, operating system, and license files etc.

You can optionally provision a node with multiple device-type backups. When a device is then attached to the network, AMF uses its device-type to find the correct configuration to use. For example you can create an x510 and an x530 provisioning configuration for a node called 'node1' and if either an x510 or an x530 is attached to that node the appropriate configuration will be used.

Use the **no** variant of this command to remove a provisioned node.

Syntax `atmf provision node <nodename> [device <device-type>]`
`no atmf provision node <nodename> [device <device-type>]`

Parameter	Description
<nodename>	The name of the provisioned node that will appear on the AMF network.
device	Optionally specify a device type.
<device-type>	Any valid device type e.g. AR3050s, ie200, x950. For a full list of valid device types use the command atmf provision node <nodename> device ? .

Mode Privileged Exec

Usage notes This command creates the directory structure for the provisioned node's file-set. It also switches to the AMF provision node prompt so that the nodes backup file-set can be created or updated. This is typically done with the **create (amf-provision)** or **clone (amf-provision)** commands.

For more information on AMF provisioning, see the [AMF Feature Overview and Configuration Guide](#)..

Example To configure node named 'node1', use the command:

```
awplus# atmf provision node node1  
awplus(atmf-provision)#
```

To configure a node named 'node1' for device type 'x530', use the command:

```
awplus# atmf provision node node1 device x530  
awplus(atmf-provision)#
```

Related commands

- atmf provision (interface)**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- copy (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: command added

atmf reboot-rolling

Overview This command enables you to reboot the nodes in an AMF working-set, one at a time, as a rolling sequence in order to minimize downtime. Once a rebooted node has finished running its configuration and its ports are up, it re-joins the AMF network and the next node is rebooted.

By adding the `url` parameter, you can also upgrade your devices' software one AMF node at a time.

The **force** parameter forces the rolling reboot to continue even if a previous node does not rejoin the AMF network. Without the **force** parameter, the unsuitable node will time-out and the rolling reboot process will stop. However, with the **force** parameter applied, the process will ignore the timeout and move on to reboot the next node in the sequence.

This command can take a significant amount of time to complete.

Syntax `atmf reboot-rolling [force] [<url>]`

Parameter	Description
<code>force</code>	Ignore a failed node and move on to the next node. Where a node fails to reboot a timeout is applied based on the time taken during the last reboot.
<code><url></code>	The path to the software upgrade file.

Mode Privileged Exec

Usage notes You can load the software from a variety of locations. The latest compatible release for a node will be selected from your selected location, based on the parameters and URL you have entered.

For example `usb:/5.5.2-2/x*-5.5.2-2-*.rel` will select from the folder `usb:/5.5.2-2` the latest file that matches the selection `x(wildcard)-5.5.2-2-(wildcard).rel`. Because `x*` is applied, each device type will be detected and its appropriate release file will be installed.

Other allowable entries are:

Entry	Used when loading software
<code>card:*.rel:</code>	from an SD card
<code>tftp:<ip-address>:</code>	from a TFTP server
<code>usb:</code>	from a USB flash drive
<code>flash:</code>	from flash memory, e.g. from one x930 switch to another
<code>scp:</code>	using secure copy
<code>http:</code>	from an HTTP file server

Several checks are performed to ensure the upgrade will succeed. These include checking the current node release boots from flash. If there is enough space on flash, the software release is copied to flash to a new location on each node as it is processed. The new release name will be updated using the **boot system<release-name>** command, and the old release will become the backup release file.

NOTE: *If you are using TFTP or HTTP, for example, to access a file on a remote device then the URL should specify the exact release filename without using wild card characters.*

On bootup the software release is verified. Should an upgrade fail, the upgrading unit will revert back to its previous software version. At the completion of this command, a report is run showing the release upgrade status of each node.

NOTE: *Take care when removing external media or rebooting your devices. Removing an external media while files are being written entails a significant risk of causing a file corruption.*

Example 1 To reboot all x530 nodes in an AMF network, use the commands:

```
Bld2_Floor_1# atmf working-set group x530
```

This command returns the following type of screen output:

```
=====
node1, node2, node3:
=====

Working set join

AMF_NETWORK[3]#
```

```
ATMF_NETWORK[3]# atmf reboot-rolling
```

When the reboot has completed, a number of status screens appear. The selection of these screens will depend on the parameters set.

```
Bld2_Floor_1#atmf working-set group x530

=====
SW_Team1, SW_Team2, SW_Team3:
=====

Working set join

ATMF_NETWORK[3]#atmf reboot-rolling
ATMF Rolling Reboot Nodes:

Node Name                Timeout
                        (Minutes)
-----
SW_Team1                  14
SW_Team2                   8
SW_Team3                   8
Continue the rolling reboot ? (y/n):y
=====
ATMF Rolling Reboot: Rebooting SW_Team1
=====

% SW_Team1 has left the working-set
Reboot of SW_Team1 has completed
=====
ATMF Rolling Reboot: Rebooting SW_Team2
=====

% SW_Team2 has left the working-set
Reboot of SW_Team2 has completed
=====
ATMF Rolling Reboot: Rebooting SW_Team3
=====

% SW_Team3 has left the working-set
Reboot of SW_Team3 has completed
=====
ATMF Rolling Reboot Complete
Node Name                Reboot Status
-----
SW_Team1                  Rebooted
SW_Team2                  Rebooted
SW_Team3                  Rebooted
=====
```

Example 2 To update firmware on all relevant devices in the network, when the new files are for 5.5.2-2.1 and are stored in a directory on a USB stick, use the commands:

```
Node_1# atmf working-set group all
ATMF_NETWORK[9]# atmf reboot-rolling usb:/5.5.2-2/
x*-5.5.2-2*.rel
```

ATMF Rolling Reboot Nodes:			
Node Name	Timeout (Minutes)	New Release File	Status

SW_Team1	8	x530-5.5.2-2.1.rel	Release Ready
SW_Team2	10	x530-5.5.2-2.1.rel	Release Ready
SW_Team3	8	---	Not Supported
HW_Team1	6	---	Incompatible
Bld1_Floor_2	2	x930-5.5.2-2.1.rel	Release Ready
Bld1_Floor_1	4	---	Incompatible
Building_1	2	---	Incompatible
Building_2	2	x950-5.5.2-2.1.rel	Release Ready
Continue upgrading releases ? (y/n):			

atmf recover

Overview This command is used to manually initiate the recovery (or replication) of an AMF node, usually when a node is being replaced.

Syntax atmf recover [*<node-name>* master *<node-name>*]
atmf recover [*<node-name>* controller *<node-name>*]

Parameter	Description
<i><node-name></i>	The name of the device whose configuration is to be recovered or replicated.
master <i><node-name></i>	The name of the master device that holds the required configuration information. Note that although you can omit both the node name and the master name; you cannot specify a master name unless you also specify the node name.
controller <i><node-name></i>	The name of the controller that holds the required configuration information. Note that although you can omit both the node name and the controller name; you cannot specify a controller name unless you also specify the node name.

Mode Privileged Exec

Usage notes The recovery/replication process involves loading the configuration file for a node that is either about to be replaced or has experienced some problem. You can specify the configuration file of the device being replaced by using the *<node-name>* parameter, and you can specify the name of the master node or controller holding the configuration file.

If the *<node-name>* parameter is not entered then the node will attempt to use one that has been previously configured. If the replacement node has no previous configuration (and has no previously used node-name), then the recovery will fail.

If the master or controller name is not specified then the device will poll all known AMF masters and controllers and execute an election process (based on the last successful backup and its timestamp) to determine which to use. If no valid backup master or controller is found, then this command will fail.

No error checking occurs when this command is run. Regardless of the last backup status, the recovering node will attempt to load its configuration from the specified master node or controller.

If the node has previously been configured, we recommend that you suspend any AMF backup before running this command. This is to prevent corruption of the backup files on the AMF master as it attempts to both backup and recover the node at the same time.

Example To recover the AMF node named Node_10 from the AMF master node named Master_2, use the following command:

```
Master_2# atmf recover Node_10 master Master_2
```

Related commands [atmf backup stop](#)
[show atmf backup](#)
[show atmf](#)

atmf recover guest

Overview Use this command to initiate a guest node recovery or replacement by reloading its backup file-set that is located within the AMF backup system. Note that this command must be run on the edge node device that connects to the guest node.

Syntax atmf recover guest [*<guest-port>*]

Parameter	Description
<i><guest-port></i>	The port number that connects to the guest node.

Mode User Exec/Privileged Exec

Example To recover a guest on node1 port1.0.1, use the following command
`node1# atmf recover guest port1.0.1`

Related commands [show atmf backup guest](#)

atmf recover led-off

Overview This command turns off the recovery failure flashing port LEDs. It reverts the LED's function to their normal operational mode, and in doing so assists with resolving the recovery problem. You can repeat this process until the recovery failure has been resolved. For more information, see the [AMF Feature Overview and Configuration Guide](#).

Syntax atmf recover led-off

Default Normal operational mode

Mode Privileged Exec

Example To revert the LEDs on Node1 from recovery mode display to their normal operational mode, use the command:

```
Node1# atmf recover led-off
```

Related commands [atmf recover](#)

atmf recover over-eth

Overview Use this command to enable AMF recovery over an AR-series device's Eth port. This setting persists even after restoring a device to a 'clean' state with the **erase factory-default** or **atmf cleanup** command.

Use the **no** variant of this command to disable AMF recover over an Eth port.

Syntax `atmf recover over-eth`
`no atmf recover over-eth`

Default Eth ports cannot be used for recovery.

Mode Privileged Exec

Usage notes AMF links over Eth ports are only available if your network is running in AMF secure mode (see **atmf secure-mode** for more information on AMF secure mode).

Example To enable AMF recovery over an Eth port, use the command:

```
awplus# atmf recover over-eth
```

To disable AMF recovery over an Eth port, use the commands:

```
awplus# no atmf recover over-eth
```

Related commands **atmf-link**
atmf recover
atmf secure-mode
erase factory-default
show atmf detail

Command changes Version 5.5.0-1.1: command added

atmf recovery-server

Overview Use this command on an AMF master to process recovery requests from isolated AMF nodes. An isolated node is an AMF member that is only connected to the rest of the AMF network via a virtual-link.

This option allows these nodes, which have no AMF neighbors, to be identified for recovery or provisioning purposes. They are identified using an identity token which is stored on the AMF master.

Use the **no** variant of this command to disable processing of recovery requests from isolated AMF nodes.

Syntax atmf recovery-server
no atmf recovery-server

Default Recovery-server is disabled by default.

Mode Global Configuration

Usage notes Once **recovery-server** is enabled on an AMF network, the next time an isolated node is backed up its identity token will be stored in the AMF master's database. Should the device fail it can then be replaced and auto-recovery will occur as long as:

- the AMF master is accessible to the isolated node, and
- either, a DHCP server is configured to send the Uniform Resource Identifier (URI) of the AMF master to the recovering node, or
- a DNS server is configured to resolve the default recovery URI (<https://amfrecovery.alliedtelesis.com>) to the IP address of the AMF master.

Provisioning of isolated nodes is achieved by creating an identity token for the new node using the **identity (amf-provision)** command.

See the **AMF Feature Overview and Configuration Guide** for information on preparing your network for recovering or provisioning isolated nodes.

Example To enable recovery-server on an AMF master, use the commands:

```
awplus# configure terminal
awplus(config)# atmf recovery-server
```

To disable recovery-server on an AMF master, use the commands:

```
awplus# configure terminal
awplus(config)# no atmf recovery-server
```

- Related commands

atmf backup

atmf cleanup

identity (amf-provision)

atmf virtual-link
- Command changes

Version 5.4.7-2.1: command added

atmf remote-login

Overview Use this command to remotely login to other AMF nodes in order to run commands as if you were a local user of that node.

Syntax `atmf remote-login [user <name>] <nodename>`

Parameter	Description
<name>	The name of a user on the remote node.
<nodename>	The name of the remote AMF node you are connecting to.

Mode Privileged Exec (This command will only run at privilege level 15)

Usage notes You do not need a valid login on the local device in order to run this command. The session will take you to the enable prompt on the new device. If the remote login session exits for any reason (e.g. device reboot) you will be returned to the originating node.

You can create additional user accounts on nodes. AMF's goal is to provide a uniform management plane across the whole network, so we recommend you use the same user accounts on all the nodes in the network.

In reality, though, it is not essential to have the same accounts on all the nodes. Users can remote login from one node to a second node even if they are logged into the first node with a user account that does not exist on the second node (provided that **atmf restricted-login** is disabled and the user account on the first node has privilege level 15).

Moreover, it is possible to use a RADIUS or TACACS+ server to manage user authentication, so users can log into AMF nodes using user accounts that are present on the RADIUS or TACACS+ server, and not present in the local user databases of the AMF nodes.

The software will not allow you to run multiple remote login sessions. You must exit an existing session before starting a new one.

If you disconnect from the VTY session without first exiting from the AMF remote session, the device will keep the AMF remote session open until the **exec-timeout** time expires (10 minutes by default). If the exec-timeout time is set to infinity (**exec-timeout 0 0**), then the device is unable to ever close the remote session. To avoid this, we recommend you use the **exit** command to close AMF remote sessions, instead of closing the associated VTY sessions. We also recommend you avoid setting the exec-timeout to infinity.

Example To remotely login from node Node10 to Node20, use the following command:

```
Node10# atmf remote-login node20
```

```
Node20>
```

To close the session on Node20 and return to Node10's command line, use the following command:

```
Node20# exit
```

```
Node10#
```

In this example, user User1 is a valid user of node5. They can remotely login from node5 to node3 by using the following commands:

```
node5# atmf remote-login user User1 node3
```

```
node3> enable
```

Related commands [atmf restricted-login](#)

Command changes Version 5.4.6-2.1: changes to AMF user account requirements

atmf restricted-login

Overview By default, users who are logged into any node on an AMF network are able to manage any other node by using either working-sets or an AMF remote login. If the access provided by this feature is too wide, or contravenes network security restrictions, it can be limited by running this command, which changes the access so that:

- users who are logged into non-master nodes cannot execute any commands that involve working-sets, and
- from non-master nodes, users can use remote-login, but only to login to a user account that is valid on the remote device (via a statically configured account or RADIUS/TACACS+). Users are also required to enter the password for that user account.

Once entered on any AMF master node, this command will propagate across the network.

Use the **no** variant of this command to disable restricted login on the AMF network. This allows access to the **atmf working-set** command from any node in the AMF network.

Syntax atmf restricted-login
no atmf restricted-login

Mode Privileged Exec

Default Master nodes operate with **atmf restricted-login** disabled.
Member nodes operate with **atmf restricted-login** enabled.

NOTE: The default conditions of this command vary from those applied by its “no” variant. This is because the restricted-login action is only applied by nodes, and in the absence of a master node, the default is to apply the restricted action to all nodes with AMF configured.

Usage notes In the presence of a **master** node, its default of **atmf restricted-login disabled** will propagate to all its member nodes. Similarly, any change in this command’s status that is made on a master node, will also propagate to all its member nodes

Note that once you have run this command, certain other commands that utilize the AMF working-set command, such as the **include**, **atmf reboot-rolling** and **show atmf group members** commands, will operate only on master nodes.

Restricted-login must be enabled on AMF areas with more than 120 nodes.

Example To enable restricted login, use the command

```
Node_20(config)# atmf restricted-login node20
```

Related commands **atmf remote-login**
show atmf

Command changes Version 5.4.6-2.1: changes to AMF user account requirements

atmf retry guest-link

Overview Use this command to retry an AMF guest-link by restarting AMF guest discovery on a port if it is currently in the failed state.

If no port is specified then all configured AMF guest-link ports that are in the failed state are retried.

If a port is specified then that port will only be retried if it is both:

- configured as an AMF guest-link, and
- it is currently in the failed state.

Syntax `atmf retry guest-link [<interface>]`

Parameter	Description
<code><interface></code>	Name of the interface the guest-link you want to retry is configured on.

Mode Privileged Exec

Example To retry all configured AMF guest-link currently in a failed state, use the command:

```
awplus# atmf retry guest-link
```

To retry an AMF guest-link configured on port1.0.2 currently in a failed state, use the command:

```
awplus# atmf retry guest-link port1.0.2
```

Related commands [show atmf links guest](#)
[switchport atmf-guestlink](#)

atmf secure-mode

Overview Use this command to enable AMF secure mode on an AMF node. AMF secure mode makes an AMF network more secure by:

- Adding an authorization mechanism before an AMF member is allowed to join an AMF network.
- The encryption of all AMF packets sent between AMF nodes.
- Adding support for user login authentication by RADIUS or TACACS+, and removing the requirement to have the same privileged user account in the local user database on all devices in the AMF network.
- Adding additional logging which enables network administrators to monitor attempts to gain unauthorized access to the AMF network.

Once the secure mode command is run on all nodes on an AMF network, the AMF masters and AMF controllers manage the addition of AMF nodes and AMF areas to the AMF network.

Use the **no** variant of this command to disable AMF secure mode on an AMF node.

Syntax atmf secure-mode
no atmf secure-mode

Default Secure mode is disabled by default.

Mode Global Configuration

Usage notes When an AMF network is running in AMF secure mode the **atmf restricted-login** feature is automatically enabled. This restricts the **atmf working-set** command to users that are logged on to an AMF master. This feature cannot be disabled independently of secure mode.

When AMF secure mode is enabled the AMF controllers and masters in the AMF network form a group of certificate authorities. A node may only join a secure AMF network once it has been authorized by a master or controller. When enabled, all devices in the AMF network must be running in secure mode. Unsecured devices will not be able to join a secure AMF network.

Example To enable AMF secure mode on an AMF node, use the commands:

```
awplus# configure terminal
awplus(config)# atmf secure-mode
```

To disable AMF secure mode on an AMF node, use the commands:

```
awplus# configure terminal
awplus(config)# no atmf secure-mode
```

Related commands

- atmf authorize**
- atmf secure-mode certificate expiry**
- clear atmf secure-mode certificates**
- clear atmf secure-mode statistics**
- show atmf**
- show atmf authorization**
- show atmf secure-mode**
- show atmf secure-mode certificates**
- show atmf secure-mode sa**
- show atmf secure-mode statistics**

Command changes Version 5.4.7-0.3: command added

atmf secure-mode certificate expire

Overview Use this command on an AMF master to expire a secure mode certificate. Running this command will force the removal of the AMF node from the network.

Syntax `atmf secure-mode certificate expire <node-name> [area <area-name>]`

Parameter	Description
<code><node-name></code>	Name of the AMF node you want to expire the certificate for.
<code>area</code>	Specify an AMF area.
<code><area-name></code>	Name of the AMF area you want to expire the AMF nodes certificate for.

Mode Privileged Exec

Example To remove an AMF node named "node3" from an AMF network, use the following command on the AMF master:

```
awplus# atmf secure-mode certificate expire node3
```

To remove an AMF node named "node2" in an area named "area2", use the following command on the AMF master:

```
awplus# atmf secure-mode certificate expire node2 area area2
```

Related commands [atmf secure-mode](#)
[show atmf secure-mode](#)
[show atmf secure-mode certificates](#)

Command changes Version 5.4.7-0.3: command added

atmf secure-mode certificate expiry

Overview Use this command to set the expiry time of AMF secure mode certificates. Once an AMF node's certificate expires it must re-authorize and obtain a new certificate from the AMF master.

Use the **no** variant of this command to reset the expiry time to 180 days.

Syntax atmf secure-mode certificate expiry {<days>|infinite}
no atmf secure-mode certificate expiry

Parameter	Description
<days>	Length of time, in days, that an AMF secure mode certificate remains valid. A value between 1 and 365.
infinite	The authorization certificate does not expire, in other words AMF nodes stay authorized indefinitely.

Default The default expiry time is 180 days.

Mode Global Configuration

Example To set AMF secure mode certificate expiry to 7 days, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# atmf secure-mode certificate expiry 7
```

To set AMF secure mode certificates to never expire, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# atmf secure-mode certificate expiry infinite
```

To reset the certificate expiry to 180 days, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no atmf secure-mode certificate expiry
```

Related commands [atmf secure-mode](#)
[show atmf secure-mode](#)
[show atmf secure-mode certificates](#)

Command changes Version 5.4.7-0.3: command added

atmf secure-mode certificate renew

Overview Use this command to force all local certificates to expire and be renewed on an AMF secure mode network.

Secure mode certificates renew automatically but this command could be used to renew a certificate in a situation where the automatic renewal may happen while the device is not attached to the AMF network.

Syntax atmf secure-mode certificate renew

Mode Privileged Exec

Example To renew a local certificate on a AMF member or AMF master, use the command:

```
awplus# atmf secure-mode certificate renew
```

Related commands [show atmf secure-mode certificates](#)
[show atmf secure-mode statistics](#)

Command changes Version 5.4.7-0.3: command added

atmf secure-mode enable-all

Overview Use this command to enable AMF secure mode on an entire network. AMF secure mode makes an AMF network more secure by:

- Adding an authorization mechanism before an AMF member is allowed to join an AMF network.
- The encryption of all AMF packets sent between AMF nodes.
- Adding support for user login authentication by RADIUS or TACACS+, and removing the requirement to have the same privileged user account in the local user database on all devices in the AMF network.
- Adding additional logging which enables network administrators to monitor attempts to gain unauthorized access to the AMF network.

Once this command is run on an AMF network, the AMF masters and AMF controllers manage the addition of AMF nodes and AMF areas to the AMF network.

This command can only be run on an AMF master.

Use the **no** variant of this command to disable AMF secure mode on an entire network.

Syntax atmf secure-mode enable-all
no atmf secure-mode enable-all

Default Secure mode is disabled by default.

Mode Privileged Exec

Usage notes When an AMF network is running in AMF secure mode the **atmf restricted-login** feature is automatically enabled. This restricts the **atmf working-set** command to users that are logged on to an AMF master. This feature cannot be disabled independently of secure mode.

When AMF secure mode is enabled the AMF controllers and masters in the AMF network form a group of certificate authorities. A node may only join a secure AMF network once it has been authorized by a master or controller. When enabled, all devices in the AMF network must be running in secure mode. Unsecured devices will not be able to join a secure AMF network.

Running **atmf secure-mode enable-all**:

- Groups all AMF members in a working set.
- Executes **clear atmf secure-mode certificates** on the working set of members, which removes existing secure mode certificates from all the nodes.
- Groups all the AMF masters in a working set.
- Executes **atmf authorize provision all** on the working set of masters, so all masters provision all nodes.
- Groups all AMF nodes in a working set.
- Runs a script which executes **atmf secure-mode** and then writes the configuration file on each node.
- Starts a timer that ticks every 10 seconds, for a maximum of 10 times, and checks if all the secure mode capable nodes rejoin the AMF network.

Running **no atmf secure-mode enable-all**:

- Groups all AMF nodes in a working set.
- Runs a script which executes **no atmf secure-mode** and then writes the configuration file on each node.
- Starts a timer that ticks every 10 seconds, for a maximum of 10 times, and checks if all the secure mode capable nodes rejoin the AMF network.

NOTE: Enabling or disabling secure mode on the network saves the running-config on every device.

Example To enable AMF secure mode on the entire network, use the command:

```
awplus# atmf secure-mode enable-all
```

You will be prompted to confirm the action:

```
Total number of nodes 21
21 nodes support secure-mode

Enable secure-mode across the AMF network ? (y/n): y
```

To disable AMF secure mode on the entire network, use the command:

```
awplus# no atmf secure-mode enable-all
```

You will be prompted to confirm the action:

```
% Warning: All security certificates will be deleted.
Disable secure-mode across the AMF network ? (y/n): y
```

Related commands **aaa authentication auth-web**
show atmf

Command changes Version 5.4.7-0.3: command added

atmf select-area

Overview Use this command to access devices in an area outside the core area on the controller network. This command will connect you to the remote area-master of the specified area.

This command is only valid on AMF controllers.

The **no** variant of this command disconnects you from the remote area-master.

Syntax `atmf select-area {<area-name>|local}`
`no atmf select-area`

Parameter	Description
<code><area-name></code>	Connect to the remote area-master of the area with this name.
<code>local</code>	Return to managing the local controller area.

Mode Privileged Exec

Usage notes After running this command, use the **atmf working-set** command to select the set of nodes you want to access in the remote area.

Example To access nodes in the area Canterbury, use the command

```
controller-1# atmf select-area Canterbury
```

This displays the following output:

```
Test_network[3]#atmf select-area Canterbury
=====
Connected to area Canterbury via host Avensis:
=====
```

To return to the local area for controller-1, use the command

```
controller-1# atmf select-area local
```

Alternatively, to return to the local area for controller-1, use the command

```
controller-1# no atmf select-area
```

Related commands **atmf working-set**

atmf topology-gui enable

Overview Use this command to enable the operation of Vista Manager EX on the Master device.

Vista Manager EX delivers state-of-the-art monitoring and management for your Autonomous Management Framework™ (AMF) network, by automatically creating a complete topology map of switches, firewalls and wireless access points (APs). An expanded view includes third-party devices such as security cameras.

Use the **no** variant of this command to disable operation of Vista Manager EX.

Syntax atmf topology-gui enable
no atmf topology-gui enable

Default Disabled by default on AMF Master and member nodes. Enabled by default on Controllers.

Mode Global Configuration mode

Usage notes To use Vista Manager EX, you must also enable the HTTP service on all AMF nodes, including all AMF masters and controllers. The HTTP service is enabled by default on AlliedWare Plus switches and disabled by default on AR-Series firewalls. To enable it, use the commands:

```
Node1# configure terminal
Node1(config)# service http
```

On one master in each AMF area in your network, you also need to configure the master to send event notifications to Vista Manager EX. To do this, use the commands:

```
Node1# configure terminal
Node1(config)# log event-host <ip-address> atmf-topology-event
```

Examples To enable Vista Manager EX on Node1, use the commands:

```
Node1# configure terminal
Node1(config)# atmf topology-gui enable
```

To disable Vista Manager EX on Node1, use the commands:

```
Node1# configure terminal
Node1(config)# no atmf topology-gui enable
```

Related **atmf enable**
commands **log event-host**
service http

atmf trustpoint

Overview Use this command to set a PKI trustpoint for an AMF network. This command needs to be run on an AMF master or controller.

The self-signed certificate authority (CA) certificate is distributed to every node on the AMF network. It is used to verify client certificates signed by the trustpoint.

Use the **no** variant of this command to remove an AMF trustpoint.

Syntax atmf trustpoint <trustpoint-name>
no atmf trustpoint <trustpoint-name>

Parameter	Description
<trustpoint-name>	Name of the trustpoint.

Default No trustpoint is configured by default.

Mode Global Configuration

Usage notes Before using the **atmf trustpoint** command you will need to establish a trustpoint. For example, you can create a local self-signed trustpoint using the procedure outlined below.

Create a self-signed trustpoint called 'our_trustpoint' with keypair 'our_key':

```
awplus# configure terminal
awplus(config)# crypto pki trustpoint our_trustpoint
awplus(ca-trustpoint)# enrollment selfsigned
awplus(ca-trustpoint)# rsakeypair our_key
awplus(ca-trustpoint)# exit
awplus(config)# exit
```

Create the root and server certificates for this trustpoint:

```
awplus# crypto pki authenticate our_trustpoint
awplus# crypto pki enroll our_trustpoint
```

For more information about the AlliedWare Plus implementation of Public Key Infrastructure (PKI), see the [Public Key Infrastructure \(PKI\) Feature Overview and Configuration Guide](#)

Example To configure an AMF trustpoint for the trustpoint 'our_trustpoint', use the commands:

```
awplus# configure terminal
awplus(config)# atmf trustpoint our_trustpoint
```

To remove an AMF trustpoint for the trustpoint 'our_trustpoint', use the commands:

```
awplus# configure terminal
awplus(config)# no atmf trustpoint our_trustpoint
```

Related commands [crypto pki trustpoint](#)
[show atmf](#)

Command changes Version 5.4.7-2.1: command added

atmf virtual-crosslink

Overview Use this command to create a virtual crosslink. A virtual crosslink connects an AMF master or controller on a physical device to a Virtual AMF Appliance (VAA) master or controller.

All AMF master nodes must reside in the same AMF domain and are required to be directly connected using AMF crosslinks. In order to be able to meet this requirement for AMF masters running on VAAs, a virtual crosslink connects the AMF master or controller on the physical device to the master or controller on the VAA.

Note that AlliedWare Plus CentreCOM Series switches are AMF Edge nodes and do not support virtual links or crosslinks. This is because each edge node can only have a single physical AMF link.

Use the **no** variant of this command to remove a virtual crosslink.

Syntax `atmf virtual-crosslink id <local-id> ip <local-ip> remote-id <remote-id> remote-ip <remote-ip>`
`atmf virtual-crosslink id <local-id> ip <local-ip> remote-id <remote-id> remote-host <domainname>`
`no atmf virtual-crosslink id <local-id>`

Parameter	Description
<code>id <local-id></code>	ID of the local tunnel port, a value between 1 and 4094.
<code>ip <local-ip></code>	IPv4 address of the local tunnel port in a.b.c.d format.
<code>remote-id <remote-id></code>	ID of the remote tunnel port, a value between 1 and 4094.
<code>remote-ip <remote-ip></code>	IPv4 address of the remote tunnel port in a.b.c.d format.
<code>remote-host <domainname></code>	The domain name of the remote node.

Default No AMF virtual crosslinks are created by default.

Mode Global Configuration

Usage notes This command allows a virtual tunnel to be created between two remote sites over a Layer 3 link. The tunnel encapsulates AMF packets and allows them to be sent transparently across a Wide Area Network (WAN) such as the Internet.

Configuration involves creating a local tunnel ID, a local IP address, a remote tunnel ID, and a remote IP address or domain name. Each side of the tunnel must be configured with the same, but mirrored parameters.

NOTE: *Virtual crosslinks are not supported on AMF container masters, therefore if multiple tenants on a single VAA host are configured for secure mode, only a single AMF master is supported per area.*

Example To setup a virtual link from a local site, 'siteA', to a remote site, 'siteB', (assuming there is already IP connectivity between the sites), run the following commands at the local site:

```
siteA# configure terminal
siteA(config)# atmf virtual-crosslink id 5 ip 192.168.100.1
remote-id 10 remote-ip 192.168.200.1
```

At the remote site, run the commands:

```
siteB# configure terminal
siteB(config)# atmf virtual-crosslink id 10 ip 192.168.200.1
remote-id 5 remote-ip 192.168.100.1
```

To remove this virtual crosslink, run the following commands on the local site:

```
siteA# configure terminal
siteA(config)# no atmf virtual-crosslink id 5
```

On the remote site, run the commands:

```
siteB# configure terminal
siteB(config)# no atmf virtual-crosslink id 10
```

Related commands [atmf virtual-crosslink](#)
[show atmf links](#)
[switchport atmf-crosslink](#)

Command changes Version 5.5.2-0.1: **remote-host** parameter added
Version 5.4.7-0.3: command added

atmf virtual-link

Overview This command creates one or more Layer 2 tunnels that enable AMF nodes to transparently communicate across a wide area network using Layer 2 connectivity protocols.

Once connected through the tunnel, the remote member will have the same AMF capabilities as a directly connected AMF member.

Note that AlliedWare Plus CentreCOM Series switches are AMF Edge nodes and do not support virtual links or crosslinks. This is because each edge node can only have a single physical AMF link.

Use the **no** variant of this command to remove the specified virtual link.

Syntax

```
atmf virtual-link id <1-4094> ip <a.b.c.d> remote-id <1-4094>  
remote-ip <a.b.c.d> [remote-area <area-name>]  
atmf virtual-link id <1-4094> interface <interface-name> remote-  
id <1-4094> remote-ip <a.b.c.d> [remote-area <area-name>]  
atmf virtual-link id <1-4094> ip <a.b.c.d> remote-id <1-4094>  
remote-host <domainname> [remote-area <area-name>]  
atmf virtual-link id <1-4094> interface <interface-name> remote-  
id <1-4094> remote-host <domainname> [remote-area <area-name>]  
no atmf virtual-link id <1-4094>
```

Parameter	Description
id <1-4094>	ID of the local tunnel point, in the range 1 to 4094.
ip <a.b.c.d>	Specify the local IP address of the local interface for the virtual-link (alternatively you can specify the interface's name, see below).
interface <interface-name>	Specify the local interface name for the virtual-link. This allows you to use a dynamic, rather than a static, local IP address.
remote-id <1-4094>	The ID of the (same) tunnel that will be applied by the remote node. Note that this must match the local-id that is defined on the remote node. This means that (for the same tunnel) the local and remote tunnel IDs are reversed on the local and remote nodes.
remote-ip <a.b.c.d>	The IP address of the remote node.
remote-host <domainname>	The domain name of the remote node.
remote-area <area-name>	The name of the remote area connected to this virtual-link.

Mode Global Configuration

Usage notes The Layer 2 tunnel that this command creates enables a local AMF session to appear to pass transparently across a Wide Area Network (WAN) such as the Internet. The addresses configured as the local and remote tunnel IP addresses must have IP connectivity to each other. If the tunnel is configured to connect a head office and branch office over the Internet, typically this would involve using some type of managed WAN service such as a site-to-site VPN. Tunnels are only supported using IPv4.

Configuration involves creating a local tunnel ID, a local IP address, a remote tunnel ID and a remote IP address or domain name. A reciprocal configuration is also required on the corresponding remote device. The local tunnel ID must be unique to the device on which it is configured.

If an interface acquires its IP address dynamically then the local side of the tunnel can be specified by using the interface's name instead of using its IP address. When using a dynamic local address the remote address of the other side of the virtual-link must be configured with either:

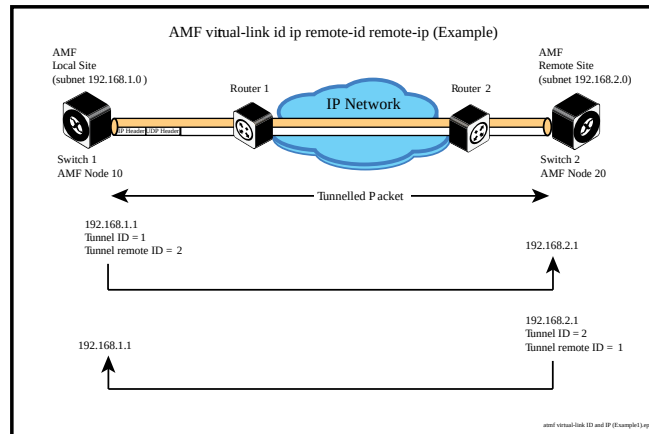
- the IP address of the NAT device the dynamically configured interface is behind, or
- 0.0.0.0, if the virtual-link is configured as a secure virtual-link.

For instructions on how to configure dynamic IP addresses on virtual-links, see the [AMF Feature Overview and Configuration Guide](#).

The tunneled link may operate via external (non AlliedWare Plus) routers in order to provide wide area network connectivity. However in this configuration, the routers perform a conventional router to router connection. The protocol tunneling function is accomplished by the AMF nodes.

NOTE: *AMF cannot achieve zero touch replacement of the remote device that terminates the tunnel connection, because you must pre-configure the local IP address and tunnel ID on that remote device.*

Example 1 Use the following commands to create the tunnel shown in the figure below.



AMF virtual link example

```
Node_10(config)# atmf virtual-link id 1 ip 192.168.1.1 remote-id
2 remote-ip 192.168.2.1
Node_20(config)# atmf virtual-link id 2 ip 192.168.2.1 remote-id
1 remote-ip 192.168.1.1
```

Example 2 To set up an area virtual link to a remote site (assuming IP connectivity between the sites already), one site must run the following commands:

```
SiteA# configure terminal
```

```
SiteA(config)# atmf virtual-link id 5 ip 192.168.100.1 remote-id
10 remote-ip 192.168.200.1 remote-area SiteB-AREA
```

The second site must run the following commands:

```
SiteB# configure terminal
```

```
SiteB(config)# atmf virtual-link id 10 ip 192.168.200.1 remote-
id 5 remote-ip 192.168.100.1 remote-area SiteA-AREA
```

Before you can apply the above **atmf virtual-link** command, you must configure the area names *SiteB-AREA* and *SiteA-AREA*.

Related commands

- [atmf virtual-link description](#)
- [atmf virtual-link protection](#)
- [show atmf](#)
- [show atmf links](#)
- [show atmf virtual-links](#)

Command Version 5.5.2-0.1: **remote-host** parameter added
changes Version 5.4.9-0.1: **interface** parameter added

atmf virtual-link description

Overview Use this command to add a description to an existing AMF virtual-link.

Note that AlliedWare Plus CentreCOM Series switches are AMF Edge nodes and do not support virtual links or crosslinks. This is because each edge node can only have a single physical AMF link.

Use the **no** variant of this command to remove a description from an AMF virtual-link.

Syntax `atmf virtual-link id <1-4094> description <description>`
`no atmf virtual-link id <1-4094> description`

Parameter	Description
<code>id <1-4094></code>	ID of the local tunnel point.
<code><description></code>	A description for the virtual-link.

Default No description is set by default.

Mode Global Configuration

Example To add a description to the virtual-link with id '5', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# atmf virtual-link id 5 description T0 SITE B
```

To remove a description from the virtual-link with id '5', use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no atmf virtual-link id 5
```

Related commands [atmf virtual-link](#)
[show atmf links](#)
[show atmf virtual-links](#)

atmf virtual-link protection

Overview Use this command to add protection to an existing AMF virtual-link. Secure AMF virtual-links encapsulate the L2TPv3 frames of the virtual-link with IPsec.

Note that AlliedWare Plus CentreCOM Series switches are AMF Edge nodes and do not support virtual links or crosslinks. This is because each edge node can only have a single physical AMF link.

Use the **no** variant of this command to remove protection from an AMF virtual-link.

Syntax `atmf virtual-link id <1-4094> protection ipsec key [8] <key-string>`

`no atmf virtual-link id <1-4094> protection`

Parameter	Description
id	Specify the link ID.
	< Link ID in the range 1 to 4094
p	Protection is on for this link.
i	Security provided using IPsec.
k	Set the shared key.
8	Specifies a string in an encrypted format instead of plain text. The running config will display the new password as an encrypted string even if password encryption is turned off.
< s	Specify the shared key for the link.

Default Protection is off by default.

Mode Global Configuration

Usage notes Considered the following limitations when creating a secure virtual-link:

- Switch devices support a maximum of 20 downstream AMF nodes when using a secure virtual-link as an uplink.
- When there are two or more AMF members behind a shared NAT device, only one of the members will be able to use secure virtual-links.
- An AMF multi-tenant environment supports a maximum cumulative total of 1200 secure virtual-links across all AMF containers.

Example To create and configure a virtual link with protection, first create the virtual-link:

```
Host-A# configure terminal
```

```
Host-A(config)# atmf virtual-link id 1 ip 192.168.1.1 remote-id  
2 remote-ip 192.168.2.1
```

The enable protection on the virtual link:

```
Host-A(config)# atmf virtual-link id 1 protection ipsec key  
securepassword
```

Repeat these steps on the other side of the link:

```
Host-B(config)# atmf virtual-link id 2 ip 192.168.2.1 remote-id  
1 remote-ip 192.168.1.1
```

```
Host-B(config)# atmf virtual-link id 2 protection ipsec key  
securepassword
```

Related commands

- atmf virtual-link**
- show atmf**
- show atmf links**
- show atmf virtual-links**

Command changes Version 5.4.9-0.1: command added

atmf working-set

Overview Use this command to execute commands across an individually listed set of AMF nodes or across a named group of nodes.

Note that this command can only be run on a master node.

Use the **no** variant of this command to remove members or groups from the current working-set.

Syntax `atmf working-set { [<node-list> ] | [group {<group-list> | all | local | current}] }`
`no atmf working-set { [<node-list> ] | [group <group-list>] }`

Parameter	Description
<node-list>	A comma delimited list (without spaces) of nodes to be included in the working-set.
group	The AMF group.
<group-list>	A comma delimited list (without spaces) of groups to be included in the working-set. Note that this can include either defined groups, or any of the Automatic, or Implicit Groups shown earlier in the bulleted list of groups.
all	All nodes in the AMF.
local	Local node Running this command with the parameters group local will return you to the local prompt and local node connectivity.
current	Nodes in current list.

Mode Privileged Exec

Usage notes

You can put AMF nodes into groups by using the **atmf group (membership)**.

This command opens a session on multiple network devices. When you change the working set to anything other than the local device, the prompt will change to the AMF network name, followed by the size of the working set, shown in square brackets. This command has to be run at privilege level 15.

In addition to the user defined groups, the following system assigned groups are automatically created:

- Implicit Groups
 - local: The originating node.
 - current: All nodes that comprise the current working-set.
 - all: All nodes in the AMF.
- Automatic Groups - These can be defined by hardware architecture, e.g. x510, x610, x8100, AR3050S or AR4050S, or by certain AMF nodal designations such as master.

Note that the Implicit Groups do not appear in **show atmf group** command output.

If a node is an AMF master it will be automatically added to the master group.

Example 1 To add all nodes in the AMF to the working-set, use the command:

```
node1# atmf working-set group all
```

NOTE: This command adds the implicit group "all" to the working set, where "all" comprises all nodes in the AMF.

This command displays an output screen similar to the one shown below:

```
=====
node1, node2, node3, node4, node5, node6:
=====

Working set join

ATMF_NETWORK_Name[6]#
```


Example 2 To return to the local prompt, and connect to only the local node, use the command:

```
ATMF_Network_Name[6]# atmf working-set group local  
node1#
```

The following table describes the meaning of the prompts in this example.

Parameter	Description
ATMF_Network_Name	The name of the AMF network, as set by the atmf network-name .
[6]	The number of nodes in the working-set.
node1	The name of the local node, as set by the hostname .

bridge-group (amf-container)

Overview Use this command to connect an AMF container to a bridge created on a Virtual AMF Appliance (VAA) virtual machine for AMF Cloud. This allows the AMF container to connect to a physical network.

Note that this command is only available on AMF Cloud, not on AlliedWare Plus switches.

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Use the **no** variant of this command to remove a bridge-group from an AMF container.

Syntax bridge-group <bridge-id>
no bridge-group

Parameter	Description
<bridge-id>	The ID of the bridge group to join, a number between 1 and 64.

Mode AMF Container Configuration

Usage notes Each container has two virtual interfaces:

1. Interface eth0, used to connect to the AMF controller on the VAA host via an AMF area-link, and configured using this [area-link](#) command.
2. Interface eth1, used to connect to the outside world using a bridged L2 network link, and configured using the **bridge-group** command.

Before using this command, a bridge must be created with the same bridge-id on the VAA host using the **bridge <bridge-id>** command.

See the [AMF Feature Overview and Configuration Guide](#) for more information on configuring the bridge.

Example To assign a bridge group to AMF container 'vac-wlg-1', use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# bridge-group 1
```

Related **atmf container**
commands **show atmf container**

Command Version 5.4.7-0.1: command added
changes

clear application-proxy threat-protection

Overview Use this command to clear the threat protection for a specified address.

Syntax `clear application-proxy threat-protection {<ip-address>|<mac-address>|all}`

Parameter	Description
<ip-address>	The IPv4 address you wish to clear the threat for, in A.B.C.D format.
<mac-address>	The MAC address you wish to clear the threat for, in HHHH.HHHH.HHHH format.
all	Clear the threat for all IPv4 and MAC addresses.

Mode Privileged Exec

Example To clear the threat for 10.34.199.117, use the command:

```
awplus# clear application-proxy threat-protection 10.34.199.117
```

Related commands

- [application-proxy quarantine-vlan](#)
- [application-proxy threat-protection](#)
- [application-proxy threat-protection send-summary](#)
- [service atm-application-proxy](#)
- [show application-proxy threat-protection](#)

Command changes Version 5.4.7-2.2: command added

clear atmf links

Overview Use this command with no parameters to manually reset all the AMF links on a device. You can optionally specify an interface or range of interfaces to reset the links on.

Certain events or topology changes can cause AMF links to be incorrect or outdated. Clearing the links forces AMF to relearn the information from neighboring nodes and create a fresh, correct, view of the network.

Syntax `clear atmf links [<interface-list>]`

Parameter	Description
<interface-list>	The interfaces or ports to perform the reset on. An interface-list can be: • a switchport (e.g. port1.0.1) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a local port (e.g. of0) • You can specify a continuous range of interfaces separated by a hyphen, or a comma-separated list (e.g. port1.0.1, port1.0.4-port1.0.18). The specified interfaces must exist. If this parameter is left out then all links of the specified type will be reset on the device.

Mode Privileged Exec

Example To clear all AMF links on a device, use the following command:

```
awplus# clear atmf links
```

To clear all AMF links on port1.0.1 to port1.0.4 and static aggregator sa1, use the following command:

```
awplus# clear atmf links port1.0.1-port1.0.4,sa1
```

Related commands [clear atmf links virtual](#)
[show atmf links](#)

Command changes Version 5.4.8-2.1: command added

clear atmf links virtual

Overview Use this command with no parameters to manually reset all the AMF virtual links on a device. You can, optionally, specify a comma separated list of virtual links to reset.

Certain events or topology changes can cause AMF links to be incorrect or outdated. Clearing the links forces AMF to relearn the information from neighboring nodes and create a fresh, correct view of the network.

Syntax `clear atmf links virtual [<virtuallink-list>]`

Parameter	Description
<virtuallink-list>	A single, or list, of AMF virtual link identifiers to reset. This must be a comma separated list of links e.g. <i>vlink1</i> , <i>vlink2</i> , <i>vlink3</i> . Specifying a link range e.g. <i>vlink1-vlink3</i> is not supported.

Mode Privileged Exec

Example To clear all AMF virtual links on a device, use the following command:

```
awplus# clear atmf links virtual
```

To clear AMF virtual links *vlink11* and *vlink21*, use the following command:

```
awplus# clear atmf links virtual vlink11,vlink22
```

Related commands [clear atmf links](#)
[show atmf links](#)

Command changes Version 5.4.8-2.1: command added

clear atmf links statistics

Overview This command resets the values of all AMF link, port, and global statistics to zero.

Syntax clear atmf links statistics

Mode Privilege Exec

Example To reset the AMF link statistics values, use the command:

```
node_1# clear atmf links statistics
```

Related commands [show atmf links statistics](#)

clear atmf recovery-file

Overview Use this command to delete all of a node's recovery files. It deletes the recovery files stored on:

- the local node,
- neighbor nodes, and
- external media (USB or SD card).

Syntax clear atmf recovery-file

Mode Privileged Exec

Usage notes AMF recovery files are created for nodes with special links. Special links include:

- virtual links,
- area links terminating on an AMF master, and
- area virtual links terminating on an AMF master.

An AMF node with one of these special links pushes its startup configuration to its neighbors and to any attached external media. It then fetches and applies this configuration at recovery time. This configuration enables it to contact the AMF master and initiate a recovery.

Recovery files can become out of date if:

- a node's neighbor is off line when changes are made to its configuration, or
- when a node no longer contains a special link.

Example To clear a node's recovery files, use the command:

```
node1# clear atmf recovery-file
```

Output The following shows typical output.

If AlliedWare Plus detects that a node contains a special link then the following message is displayed

```
node1#clear atmf recovery-file
% Warning: ATMF recovery files have been removed.
ATMF recovery may fail. Please save running-configuration.
```

Related commands [show atmf recovery-file](#)

Command changes Version 5.4.8-0.2: command added

clear atmf secure-mode certificates

Overview Use this command to remove all certificates from an AMF member or master. AMF nodes will need to be re-authorized once this command has been run.

Syntax clear atmf secure-mode certificates

Mode Privileged Exec

Example To clear all certificates from an AMF node, use the command:

```
awplus# clear atmf secure-mode certificates
```

If this is the only master on the network you will see the following warning:

```
% Warning: This node is the only master in the network!
All the nodes will become isolated and refuse to join any ATMF
network. The certificates on all the isolated nodes must be
cleared before rejoining an ATMF network will be possible.

To clear certificates a reboot of the device is required.
Clear certificates and Reboot ? (y/n):
```

On an AMF member you will see the following message:

```
To clear certificates a reboot of the device is required.
Clear certificates and Reboot ? (y/n):
```

Related commands

- [atmf authorize](#)
- [atmf secure-mode](#)
- [show atmf authorization](#)
- [show atmf secure-mode certificates](#)

Command changes Version 5.4.7-0.3: command added

clear atmf secure-mode statistics

Overview Use this command to reset all secure mode statistics to 0.

Syntax clear atmf secure-mode statistics

Mode Privileged Exec

Example To reset the AMF secure mode statistics information, use the command:

```
awplus# clear atmf secure-mode statistic
```

Related commands [show atmf secure-mode](#)
[show atmf secure-mode statistics](#)

Command changes Version 5.4.7-0.3: command added

clone (amf-provision)

Overview This command sets up a space on the backup media for use with a provisioned node and copies into it almost all files and directories from a chosen backup or provisioned node.

Alternatively, you can set up a new, unique provisioned node by using the command **create (amf-provision)**.

Syntax `clone <source-nodename>`

Parameter	Description
<code><source-nodename></code>	The name of the node whose configuration is to be copied for loading to the clone.

Mode AMF Provisioning

Usage notes This command is only available on master nodes in the AMF network.

When using this command it is important to be aware of the following:

- A copy of `<media>:atmf/<atmf_name>/nodes/<source_node>/flash` will be made for the provisioned node and stored in the backup media.
- The directory `<node_backup_dir>/flash/.config/ssh` is excluded from the copy.
- All contents of `<root_backup_dir>/nodes/<nodename>` will be deleted or overwritten.
- Settings for the expected location of other provisioned nodes are excluded from the copy.

The active and backup configuration files are automatically modified in the following ways:

- The **hostname** command is modified to match the name of the provisioned node.
- The **stack virtual-chassis-id** command is removed, if present.

Example To copy from the backup of 'device2' to create backup files for the new provisioned node 'device3' use the following command:

```
device1# atmf provision node device3
device1(atmf-provision)# clone device2
```

Sample output from the clone command

```
device1# atmf provision node device3
device1(atmf-provision)#clone device2
Copying...
Successful operation
```

To confirm that a new provisioned node has been cloned, use the command:

```
device1# show atmf backup
```

The output from this command is shown in the following figure, and shows the details of the new provisioned node 'device3'.

Sample output from the show atmf backup command

```
device1#show atmf backup

Scheduled Backup ..... Enabled
  Schedule ..... 1 per day starting at 03:00
  Next Backup Time .... 01 Oct 2018 03:00
  Backup Bandwidth ..... Unlimited
  Backup Media ..... USB (Total 7446.0MB, Free 7297.0MB)
  Server Config .....
    Synchronization ..... Unsynchronized
      Last Run ..... -
        1 ..... Unconfigured
        2 ..... Unconfigured
  Current Action ..... Idle
    Started ..... -
    Current Node ..... -

-----
Node Name      Date          Time          In ATMF  On Media  Status
-----
device3        -             -             No       Yes       Prov
device1        30 Sep 2018   00:05:49      No       Yes       Good
device2        30 Sep 2018   00:05:44      Yes      Yes       Good
```

Related commands

- atmf provision (interface)**
- atmf provision node**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- copy (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

configure boot config (amf-provision)

Overview This command sets the configuration file to use during the next boot cycle. This command can also set a backup configuration file to use if the main configuration file cannot be accessed for an AMF provisioned node. To unset the boot configuration or the backup boot configuration use the **no boot** command.

Syntax `configure boot config [backup] <file-path|URL>`
`configure no boot config [backup]`

Parameter	Description
backup	Specify that this is the backup configuration file.
<file-path|URL>	The path or URL and name of the configuration file.

Default No boot configuration files or backup configuration files are specified for the provisioned node.

Mode AMF Provisioning

Usage notes When using this command to set a backup configuration file, the specified AMF provisioned node must exist. The specified file must exist in the flash directory created for the provisioned node in the AMF remote backup media.

Examples To set the configuration file 'branch.cfg' on the AMF provisioned node 'node1', use the command:

```
MasterNodeName# atmf provision node node1
```

```
MasterNodeName(atmf-provision)# configure boot config branch.cfg
```

To set the configuration file 'backup.cfg' as the backup to the main configuration file on the AMF provisioned node 'node1', use the command:

```
MasterNodeName(atmf-provision)# configure boot config backup  
usb:/atmf/amf_net/nodes/node1/config/backup.cfg
```

To unset the boot configuration, use the command:

```
MasterNodeName(atmf-provision)# configure no boot config
```

To unset the backup boot configuration, use the command:

```
MasterNodeName(atmf-provision)# configure no boot config backup
```

Related commands

- atmf provision (interface)**
- atmf provision node**
- clone (amf-provision)**
- configure boot system (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

configure boot system (amf-provision)

Overview This command sets the release file that will load onto a specified provisioned node during the next boot cycle. This command can also set the backup release file to be loaded for an AMF provisioned node. To unset the boot system release file or the backup boot release file use the **no boot** command.

Use the **no** variant of this command to return to the default.

This command can only be run on AMF master nodes.

Syntax configure boot system [backup] <file-path|URL>
configure no boot system [backup]

Parameter	Description
<file-path|URL>	The path or URL and name of the release file.

Default No boot release file or backup release files are specified for the provisioned node.

Mode AMF Provisioning

Usage notes When using this command to set a backup release file, the specified AMF provisioned node must exist. The specified file must exist in the flash directory created for the provisioned node in the AMF remote backup media.

Examples To set the release file x930-5.4.9-0.1.rel on the AMF provisioned node 'node1', use the command:

```
MasterNodeName# atmf provision node node1
MasterNodeName(atmf-provision)# configure boot system
x930-5.4.9-0.1.rel
```

To set the backup release file x930-5.4.8-2.5.rel as the backup to the main release file on the AMF provisioned node 'node1', use the command:

```
MasterNodeName# atmf provision node node1
MasterNodeName(atmf-provision)# configure boot system backup
card:/atmf/amf_net/nodes/node1/flash/x930-5.4.8-2.5.rel
```

To unset the boot release, use the command:

```
MasterNodeName# atmf provision node node1
MasterNodeName(atmf-provision)# configure no boot system
```

To unset the backup boot release, use the command:

```
MasterNodeName# atmf provision node node1
MasterNodeName(atmf-provision)# configure no boot system backup
```

Related commands

- atmf provision (interface)**
- atmf provision node**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

copy (amf-provision)

Overview Use this command to copy configuration and release files for the node you are provisioning.

For more information about using the copy command see [copy \(filename\)](#) in the File and Configuration Management chapter.

Syntax copy [force] <source-name> <destination-name>

Parameter	Description
force	This parameter forces the copy command to overwrite the destination file, if it already exists, without prompting the user for confirmation.
<source-name>	The filename and path of the source file. See the Introduction of the File and Configuration Management chapter for valid syntax.
<destination-name>	The filename and path for the destination file. See Introduction of the File and Configuration Management chapter for valid syntax.

Mode AMF Provisioning

Example To copy a configuration file named current.cfg from Node_4's Flash into the future_node directory, and set that configuration file to load onto future_node, use the following commands:

```
node_4# atmf provision node future_node
node_4(atmf-provision)# create
node_4(atmf-provision)# locate
node_4(atmf-provision)# copy flash:current.cfg ./future_node.cfg
node_4(atmf-provision)# configure boot config future_node.cfg
```

Related commands

- [atmf provision \(interface\)](#)
- [atmf provision node](#)
- [clone \(amf-provision\)](#)
- [create \(amf-provision\)](#)
- [delete \(amf-provision\)](#)
- [locate \(amf-provision\)](#)
- [show atmf provision nodes](#)

Command changes Version 5.4.9-2.1: command added

create (amf-provision)

Overview This command sets up an empty directory on the backup media for use with a provisioned node. This directory can have configuration and release files copied to it from existing devices. Alternatively, the configuration files can be created by the user.

An alternative way to create a new provisioned node is with the command **clone (amf-provision)**.

This command can only run on AMF master nodes.

Syntax create

Mode AMF Provisioning

Usage notes This command is only available on master nodes in the AMF network.

A date and time is assigned to the new provisioning directory reflecting when this command was executed. If there is a backup or provisioned node with the same name on another AMF master then the most recent one will be used.

Example To create a new provisioned node named "device2" use the command:

```
device1# atmf provision node device2
device1(atmf-provision)# create
```

Running this command will create the following directories:

- `<media>:atmf/<atmf_name>/nodes/<node>`
- `<media>:atmf/<atmf_name>/nodes/<node>/flash`

To confirm the new node's settings, use the command:

```
device1# show atmf backup
```

The output for the **show atmf backup** command is shown in the following figure, and shows details for the new provisioned node 'device2'.

Sample output from the show atmf backup command

```
device1#show atmf backup

Scheduled Backup ..... Enabled
  Schedule ..... 1 per day starting at 03:00
  Next Backup Time .... 01 Oct 2018 03:00
Backup Bandwidth ..... Unlimited
Backup Media ..... USB (Total 7446.0MB, Free 7315.2MB)
Server Config .....
  Synchronization ..... Unsynchronized
    Last Run ..... -
      1 ..... Unconfigured
      2 ..... Unconfigured
Current Action ..... Idle
  Started ..... -
  Current Node ..... -
```

Node Name	Date	Time	In ATMF	On Media	Status
device2	-	-	No	Yes	Prov
device1	30 Sep 2018	00:05:49	No	Yes	Good

For instructions on how to configure on a provisioned node, see the [AMF Feature Overview and Configuration Guide](#).

Related commands [atmf provision \(interface\)](#)

[atmf provision node](#)

[clone \(amf-provision\)](#)

[copy \(amf-provision\)](#)

[configure boot config \(amf-provision\)](#)

[configure boot system \(amf-provision\)](#)

[delete \(amf-provision\)](#)

[identity \(amf-provision\)](#)

[license-cert \(amf-provision\)](#)

[locate \(amf-provision\)](#)

[show atmf provision nodes](#)

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

debug atmf

Overview This command enables the AMF debugging facilities, and displays information that is relevant (only) to the current node. The detail of the debugging displayed depends on the parameters specified.

If no additional parameters are specified, then the command output will display all AMF debugging information, including link events, topology discovery messages and all notable AMF events.

The **no** variant of this command disables either all AMF debugging information, or only the particular information as selected by the command's parameters.

Syntax debug atmf [link|crosslink|arealink|database|neighbor|error|all]
no debug atmf [link|crosslink|arealink|database|neighbor|error|all]

Parameter	Description
link	Output displays debugging information relating to uplink or downlink information.
crosslink	Output displays all crosslink events.
arealink	Output displays all arealink events.
database	Output displays only notable database events.
neighbor	Output displays only notable AMF neighbor events.
error	Output displays AMF error events.
all	Output displays all AMF events.

Default All debugging facilities are disabled.

Mode User Exec and Global Configuration

Usage notes If no additional parameters are specified, then the command output will display all AMF debugging information, including link events, topology discovery messages and all notable AMF events.

NOTE: An alias to the variant of this command is .

Examples To enable all AMF debugging, use the command:

```
node_1# debug atmf
```

To enable AMF uplink and downlink debugging, use the command:

```
node_1# debug atmf link
```

To enable AMF error debugging, use the command:

```
node_1# debug atmf error
```

Related commands [no debug all](#)

debug atmf packet

Overview This command configures AMF Packet debugging parameters. The debug only displays information relevant to the current node. The command has following parameters:

Syntax debug atmf packet [direction {rx|tx|both}] [level {1|2|3}] [timeout <seconds>] [num-pkts <quantity>] [filter {node <name>|interface <ifname>} [pkt-type [1][2][3][4][5][6][7][8][9][10][11][12][13]]]

Simplified Syntax

debug atmf packet	[direction {rx|tx|both}]	
	[level {[1][2|3]}]	
	[timeout <seconds>]	
	[num-pkts <quantity>]	
debug atmf packet	filter	[node <name>]
		[interface <ifname>]
		[pkt-type [1][2][3][4][5][6][7][8][9][10][11][12][13]]

NOTE: You can combine the syntax components shown, but when doing so, you must retain their original order.

Default Level 1, both Tx and Rx, a timeout of 60 seconds with no filters applied.

NOTE: An alias to the variant of this command - - can be found elsewhere in this chapter.

Mode User Exec and Global Configuration

Usage notes If no additional parameters are specified, then the command output will apply a default selection of parameters shown below:

Parameter	Description
direction	Sets debug to packet received, transmitted, or both
rx	packets received by this node
tx	Packets sent from this node
1	AMF Packet Control header Information, Packet Sequence Number. Enter 1 to select this level.
2	AMF Detailed Packet Information. Enter 2 to select this level.
3	AMF Packet HEX dump. Enter 3 to select this level.
timeout	Sets the execution timeout for packet logging
<seconds>	Seconds
num-pkts	Sets the number of packets to be dumped
<quantity>	The actual number of packets
filter	Sets debug to filter packets
node	Sets the filter on packets for a particular Node
<name>	The name of the remote node
interface	Sets the filter to dump packets from an interface (portx.x.x) on the local node
<ifname>	Interface port or virtual-link
pkt-type	Sets the filter on packets with a particular AMF packet type
1	Crosslink Hello BPDU packet with crosslink links information. Enter 1 to select this packet type.
2	Crosslink Hello BPDU packet with downlink domain information. Enter 2 to select this packet type.
3	Crosslink Hello BPDU packet with uplink information. Enter 3 to select this packet type.

Parameter	Description
4	Downlink and uplink hello BPDU packets. Enter 4 to select this packet type.
5	Non broadcast hello unicast packets. Enter 5 to select this packet type.
6	Stack hello unicast packets. Enter 6 to select this packet type.
7	Database description. Enter 7 to select this packet type.
8	DBE request. Enter 8 to select this packet type.
9	DBE update. Enter 9 to select this packet type.
10	DBE bitmap update. Enter 10 to select this packet type.
11	DBE acknowledgment. Enter 11 to select this packet type.
12	Area Hello Packets. Enter 12 to select this packet type.
13	Gateway Hello Packets. Enter 13 to select this packet type.

Examples To set a packet debug on node 1 with level 1 and no timeout, use the command:

```
node_1# debug atmf packet direction tx timeout 0
```

To set a packet debug with level 3 and filter packets received from AMF node 1:

```
node_1# debug atmf packet direction tx level 3 filter node_1
```

To enable send and receive 500 packets only on vlink1 for packet types 1, 7, and 11, use the command:

```
node_1# debug atmf packet num-pkts 500 filter interface vlink1  
pkt-type 1 7 11
```

This example applies the **debug atmf packet** command and combines many of its options:

```
node_1# debug atmf packet direction rx level 1 num-pkts 60  
filter node x930 interface port1.0.1 pkt-type 4 7 10
```

delete (amf-provision)

Overview This command deletes files that have been created for loading onto a provisioned node. It can only be run on master nodes.

Syntax delete

Mode AMF Provisioning

Usage notes This command is only available on master nodes in the AMF network. The command will only work if the provisioned node specified in the command has already been set up (although the device itself is still yet to be installed). Otherwise, an error message is shown when the command is run.

You may want to use the **delete** command to delete a provisioned node that was created in error or that is no longer needed.

This command cannot be used to delete backups created by the AMF backup procedure. In this case, use the command **atmf backup delete** to delete the files.

NOTE: *This command allows provisioned entries to be deleted even if they have been referenced by the command, so take care to only delete unwanted entries.*

Example To delete backup files for a provisioned node named device3 use the command:

```
device1# atmf provision node device3
device1(atmf-provision)# delete
```

To confirm that the backup files for provisioned node device3 have been deleted use the command:

```
device1# show atmf backup
```

The output should show that the provisioned node device3 no longer exists in the backup file, as shown in the figure below:

Sample output showing the show atmf backup command

```
device1#show atmf backup

Scheduled Backup ..... Enabled
  Schedule ..... 1 per day starting at 03:00
  Next Backup Time .... 01 Oct 2016 03:00
Backup Bandwidth ..... Unlimited
Backup Media ..... USB (Total 7446.0MB, Free 7297.0MB)
Server Config .....
  Synchronization ..... Unsynchronized
    Last Run ..... -
    1 ..... Unconfigured
    2 ..... Unconfigured
Current Action ..... Idle
  Started ..... -
  Current Node ..... -
```

Node Name	Date	Time	In ATMF	On Media	Status
device1	30 Sep 2016	00:05:49	No	Yes	Good
device2	30 Sep 2016	00:05:44	Yes	Yes	Good

Related commands

- [atmf provision \(interface\)](#)
- [atmf provision node](#)
- [clone \(amf-provision\)](#)
- [configure boot config \(amf-provision\)](#)
- [configure boot system \(amf-provision\)](#)
- [create \(amf-provision\)](#)
- [identity \(amf-provision\)](#)
- [license-cert \(amf-provision\)](#)
- [locate \(amf-provision\)](#)
- [show atmf provision nodes](#)

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

discovery

Overview Use this command to specify how AMF learns about guest nodes.

AMF nodes gather information about guest nodes by using one of the internally defined discovery methods: dynamic, static, or agent.

Dynamic learning (the default method) means that AMF learns the guest's IP and MAC addresses from LLDP or DHCP snooping. Dynamic learning is only supported when using IPv4. For IPv6, use static learning.

With dynamic learning, ensure that the command **ip dhcp snooping delete-by-linkdown** is set.

Static learning uses the **switchport atmf-guestlink** command to specify the guest class name and IP address of the guest node attached to each individual switch port. AMF then learns the MAC addresses of each of the guests of that class from ARP or Neighbor discovery tables.

If you are using the static method, ensure that you have configured the appropriate class type for each of your statically discovered guest nodes.

Agent learning uses the AMF agent to retrieve the guest's IP and MAC address. It is only available on guest nodes that support ATMF agent, such as TQ5403 series access points. For step-by-step instructions on using agent discovery for auto-recovery of an TQ5403 series AP, see the **AMF Feature Overview and Configuration Guide**.

The **no** variant of this command returns the discovery method to **dynamic**.

Syntax discovery [dynamic|static|agent]
no discovery

Parameter	Description
dynamic	Learned from DCHCP Snooping or LLDP.
static	Statically assigned.
agent	Learned from the AMF agent.

Default Dynamic

Mode AMF Guest Configuration

Usage notes This command is one of several modal commands that are configured and applied for a specific guest-class (mode). Its settings are automatically applied to a guest-node link by the **switchport atmf-guestlink** command.

NOTE: AMF guest nodes are not supported on ports using the OpenFlow protocol.

Example 1 To configure static discovery for the guest-class 'camera', use the following commands:

```
Node1# configure terminal

Node1(config)# atmf guest-class camera

Node1(config-atmf-guest)# discovery static
```

Example 2 To return the discovery method for the guest class TQ6602 to its default of **dynamic**, use the following commands:

```
Node1# configure terminal

Node1(config)# atmf guest-class TQ6602

Node1(config-atmf-guest)# no discovery
```

Related commands

- atmf guest-class**
- switchport atmf-guestlink**
- show atmf links guest**
- show atmf nodes**

Command changes Version 5.5.3-0.1: **agent** parameter added

description (amf-container)

Overview Use this command to set the description on an AMF container on a Virtual AMF Appliance (VAA).

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Use the **no** variant of this command to remove the description from an AMF container.

Syntax description <description>
no description

Parameter	Description
<description>	Enter up to 128 characters of text describing the AMF container.

Mode AMF Container Configuration

Example To set the description for AMF container “vac-wlg-1” to “Wellington area”, use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# description Wellington area
```

To remove the description for AMF container “vac-wlg-1”, use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# no description
```

Related commands [atmf container](#)
[show atmf container](#)

Command changes Version 5.4.7-0.1: command added

erase factory-default

Overview This command erases all data from NVS and all data from flash **except** the following:

- the boot release file (a .rel file) and its release setting file
- all license files
- the latest GUI release file

The device is then rebooted and returned to its factory default condition. The device can then be used for AMF automatic node recovery.

Syntax erase factory-default

Mode Privileged Exec

Usage notes This command is an alias to the **atmf cleanup** command.

Note that you cannot use this command if you have **strict-user-process-control** enabled. Disable it before entering the **erase factory-default** command.

Example To erase data, use the command:

```
Node_1# erase factory-default
```

```
This command will erase all NVS, all flash contents except for  
the boot release, a GUI resource file, and any license files,  
and then reboot the switch. Continue? (y/n):y
```

Related commands **atmf cleanup**

firmware-url

Overview Use this command to specify the location of an AP guest node's firmware file when preparing the AP for auto-recovery. AMF cannot back up AP firmware files (only configuration files), so you need to store the firmware file somewhere accessible and use this command to provide the AlliedWare Plus device with the file's location.

For step-by-step instructions for auto-recovery of an TQ5403 series AP, see the [AMF Feature Overview and Configuration Guide](#).

Use the **no** variant of this command to remove the URL.

Syntax `firmware-url <name>`
`no firmware-url`

Parameter	Description
<code><name></code>	The file's directory or filename. We recommend specifying a directory because that makes it easier to keep the firmware file up to date. The following protocols are supported: http, https, tftp, usb, and card. Do not change the firmware file's filename.

Default No URL is configured

Mode AMF Guest Configuration

Example To specify, on a device named node2, that the firmware file for a TQ5403 AP is stored in the top level of a USB stick, use the commands:

```
node2# configure terminal
node2(config)# atmf guest-class TQ5403
node2(config-guest)# firmware-url usb:
```

To specify, on a device named node2, that the firmware file for a TQ5403 AP is stored on a TFTP server with an address of 192.168.2.1, use the commands:

```
node2# configure terminal
node2(config)# atmf guest-class TQ5403
node2(config-guest)# firmware-url tftp://192.168.2.1/
```

Related commands **atmf guest-class**
discovery
login-fallback enable
modeltype
show atmf guests
show atmf guests detail
switchport atmf-guestlink

Command changes Version 5.5.3-0.1: command added

http-enable

Overview This command is used to enable GUI access to a guest node. When **http-enable** is configured, the port number is set to its default of 80. If the guest node is using a different port for HTTP, you can configure this using the **port** parameter.

This command is used to inform the GUI that this device has an HTTP interface at the specified port number so that a suitable URL can be provided to the user.

Use the **no** variant of this command to disable HTTP.

Syntax `http-enable [port <port-number>]`
`no http-enable`

Parameter	Description
port	TCP port number.
<port-number>	The port number to be configured.

Default Not set

Mode AMF Guest Configuration

Usage notes If **http-enable** is selected without a **port** parameter the port number will default to 80.

Example To enable HTTP access to a guest node on port 80 (the default), use the following commands:

```
node1# configure terminal
node1(config)# atmf guest-class Camera
node1(config-atmf-guest)# http-enable
```

To enable HTTP access to a guest node on port 400, use the following commands:

```
node1# configure terminal
node1(config)# atmf guest-class Camera
node1(config-atmf-guest)# http-enable port 400
```

To disable HTTP access to a guest node, use the following commands:

```
node1# configure terminal
node1(config)# atmf guest-class Camera
node1(config-atmf-guest)# no http-enable
```

Related commands **atmf guest-class**
switchport atmf-guestlink
show atmf links guest
show atmf nodes

identity (amf-provision)

Overview Use this command to create an identity token for provisioning an isolated AMF node. An isolated node is an AMF member that is only connected to the rest of the AMF network via a virtual-link.

This command allows these nodes, which have no AMF neighbors, to be identified for provisioning purposes. They are identified using an identity token which is based on either the next-hop MAC address of the provisioned node, or the serial number of the device being provisioned. This identity token is stored on the AMF master.

Use the **no** variant of this command to remove the identity token for a node.

Syntax `identity mac-address <mac-address> prefix <ip-address/prefix-length>`
`identity serial-number <serial-number> prefix <ip-address/prefix-length>`
`no identity`

Parameter	Description
mac-address	Specify the next-hop MAC address of the device being provisioned.
<mac-address>	MAC address of the port the provisioned node is connected to, in the format xxxx.xxxx.xxxx.
serial-number	Specify the serial number of the device to be provisioned.
<serial-number>	Serial number of the device that is being provisioned.
prefix	IPv4 address, and prefix length, of the virtual-link interface on the isolated node
<ip-address/prefix-length>	IPv4 address, and prefix length, in A.B.C.D/M format.

Mode AMF Provisioning

Usage notes To provision an isolated node, first create a configuration for the node using the **create (amf-provision)** and/or the **clone (amf-provision)** commands.

Then create an identity token for the provisioned node by either specifying its next-hop MAC address or by specifying the serial number of the replacement device. The advantage of using the next-hop MAC address is that any device, regardless of its serial number, can be added to the network but using the serial number maybe preferred in situations where the next-hop MAC address is not easy to obtain.

The **atmf recovery-server** option must be enabled on the AMF master before attempting to provision the device. This option allows the AMF master to process recovery requests from isolated AMF nodes.

See the **AMF Feature Overview and Configuration Guide** for information on preparing your network for recovering or provisioning isolated nodes.

Example To create a identity token on your AMF master for a device named "my-x930" with serial number "A10064A172100008", use the command:

```
awplus# atmf provision node my-x930
awplus(atmf-provision)# identity serial-number A10064A172100008
prefix 192.168.2.25/24
```

To create a identity token on your AMF master for a device named "my-x930" with next-hop MAC address "0000.cd28.0880", use the command:

```
awplus# atmf provision node my-x930
awplus(atmf-provision)# identity mac-address 0000.cd28.0880
prefix 192.168.2.25/24
```

To delete the identity token from your AMF master for a device named "my-x930", use the command:

```
awplus# atmf provision node my-x930
awplus(atmf-provision)# no identity
```

Related commands

- atmf cleanup**
- atmf provision (interface)**
- atmf provision node**
- atmf recovery-server**
- atmf virtual-link**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes

- Version 5.4.9-0.1: syntax change due to new AMF provisioning mode
- Version 5.4.7-2.1: command added

license-cert (amf-provision)

Overview This command is used to set up the license certificate for a provisioned node.

The certificate file usually has all the license details for the network, and can be stored anywhere in the network. This command makes a hidden copy of the certificate file and stores it in the space set up for the provisioned node on AMF backup media.

For node provisioning, the new device has not yet been part of the AMF network, so the user is unlikely to know its product ID or its MAC address. When such a device joins the network, assuming that this command has been applied successfully, the copy of the certificate file will be applied automatically to the provisioned node.

Once the new device has been resurrected on the network and the certificate file has been downloaded to the provisioned node, the hidden copy of the certificate file is deleted from AMF backup media.

Use the **no** variant of this command to set it back to the default.

This command can only be run on AMF master nodes.

Syntax license-cert <file-path|URL>
no license-cert

Parameter	Description
<file-path|URL>	The name of the certificate file. This can include the file-path of the file.

Default No license certificate file is specified for the provisioned node.

Mode AMF Provisioning

Usage notes This command is only available on master nodes in the AMF network. It will only operate if the provisioned node specified in the command has already been set up, and if the license certification is present in the backup file. Otherwise, an error message is shown when the command is run.

Example 1 To apply the license certificate 'cert1.txt' stored on a TFTP server for AMF provisioned node "device2", use the command:

```
device1# atmf provision node device2
device1(atmf-provision)# license-cert tftp://192.168.1.1/
cert1.txt
```

Example 2 To apply the license certificate 'cert2.txt' stored in the AMF master's flash directory for AMF provisioned node 'host2', use the command:

```
device1# atmf provision node host2
device1(atmf-provision)# license-cert /cert2.txt
```

To confirm that the license certificate has been applied to the provisioned node, use the command **show atmf provision nodes**. The output from this command is shown below, and displays license certification details in the last line.

Sample output from the show atmf provision nodes command

```
device1#show atmf provision nodes
ATMF Provisioned Node Information:
Backup Media .....: SD (Total 3827.0MB, Free 3481.1MB)
Node Name           : device2
Date & Time         : 06-Oct-2016 & 23:25:44
Provision Path      : card:/atmf/nodes
Boot configuration :
Current boot image  : x510-5.4.6-1.4.rel (file exists)
Backup boot image   : x510-5.4.6-1.3.rel (file exists)
Default boot config : flash:/default.cfg (file exists)
Current boot config : flash:/abc.cfg (file exists)
Backup boot config  : flash:/xyz.cfg (file exists)
Software Licenses :
Repository file     : ../configs/.sw_v2.lic
                   : ../configs/.swfeature.lic
Certificate file    : card:/atmf/lok/nodes/awplus1/flash/.atmf-lic-cert
```

Related commands

- atmf provision (interface)**
- atmf provision node**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- locate (amf-provision)**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

locate (amf-provision)

Overview This command changes the present working directory to the directory of a provisioned node. This makes it easier to edit files and create a unique provisioned node in the backup.

This command can only be run on AMF master nodes.

NOTE: We advise that after running this command, you return to a known working directory, typically flash.

Syntax locate

Mode AMF Provisioning

Example To change the working directory that happens to be on device1 to the directory of provisioned node device2, use the following command:

```
device1# atmf provision node device2  
device1[atmf-provision]# locate
```

The directory of the node device2 should now be the working directory. You can use the command **pwd** to check this, as shown in the following figure.

Sample output from the pwd command

```
device2#pwd  
card:/atmf/building_2/nodes/device2/flash
```

The output above shows that the working directory is now the flash of device2.

Related commands

- atmf provision (interface)**
- atmf provision node**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- copy (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**
- pwd**
- show atmf provision nodes**

Command changes Version 5.4.9-0.1: syntax change due to new AMF provisioning mode

log event-host

Overview Use this command to set up an external host to log AMF topology events through Vista Manager. This command is run on the Master device.

Use the **no** variant of this command to disable log events through Vista Manager.

Syntax log event-host [<ipv4-addr>|<ipv6-addr>] atmf-topology-event
no log event-host [<ipv4-addr>|<ipv6-addr>] atmf-topology-event

Parameter	Description
<ipv4-addr>	ipv4 address of the event host
<ipv6-addr>	ipv6 address of the event host

Default Log events are disabled by default.

Mode Global Configuration

Usage notes Event hosts are set so syslog sends the messages out as they come.
Note that there is a difference between log event and log host messages:

- Log event messages are sent out as they come by syslog
- Log host messages are set to wait for a number of messages (20) to send them out together for traffic optimization.

Example To enable Node 1 to log event messages from host IP address 192.0.2.31, use the following commands:

```
Node1# configure terminal
```

```
Node1(config)# log event-host 192.0.2.31 atmf-topology-event
```

To disable Node 1 to log event messages from host IP address 192.0.2.31, use the following commands:

```
Node1# configure terminal
```

```
Node1(config)# no log event-host 192.0.2.31 atmf-topology-event
```

Related commands [atmf topology-gui enable](#)

login-fallback enable

Overview Use this command to enable login fallback on TQ model AMF guest nodes. This allows AMF to try the factory default username and password if the guest node's saved username and password fail.

Use the **no** variant of this command to disable login fallback.

Syntax login-fallback enable
no login-fallback enable

Default Disabled

Mode AMF Guest Configuration

Usage notes This feature is only supported on TQ model guest nodes.

Login fallback means: if a guest node's saved username and password fail, AMF will try to connect to the node using the factory default username and password (manager/friend). When a new TQ replaces an existing TQ, this allows the new TQ to be discovered and managed as an AMF guest node. AMF can then start the AMF guest node recovery procedure.

Example To use the login fallback feature, first create an AMF guest class for TQ model APs. Then enable the login fall back feature.

For example, to enable login fallback on the guest-class AT-TQ5k, use the commands:

```
node1#configuration terminal
node1(config)#atmf guest-class AT-TQ5k
node1(config-atmf-guest)#login-fallback enable
node1(config-atmf-guest)#end
node1#
```

Related commands [atmf guest-class](#)
[modeltype](#)
[switchport atmf-guestlink](#)
[show atmf links guest](#)

Command changes Version 5.5.0-1.1: command added

modeltype

Overview This command sets the expected model type of the guest node. The model type will default to **other** if nothing is set.

Use the **no** variant of this command to reset the model type to **other**.

Syntax modeltype {alliedware|aw+|onvif|tq|other}
no modeltype

Parameter	Description
alliedware	A legacy Allied Telesis operating system.
aw+	The Allied Telesis AlliedWare Plus operating system.
onvif	ONVIF (Open Network Video Interface Forum) Profile Q devices
tq	An Allied Telesis TQ Series wireless access point.
other	Used where the model type is outside the above definitions.

Default Default to **other**

Mode AMF Guest Configuration

Examples To assign the model type **tq** to the guest-class called 'tq_device', use the commands:

```
node1# configure terminal
node1(config)# atmf guest-class tq_device
node1(config-atmf-guest)# modeltype tq
```

To remove the model type **tq** from the guest-class called 'tq_device', and reset it to the default of **other**, use the commands:

```
node1# configure terminal
node1(config)# atmf guest-class tq_device
node1(config-atmf-guest)# no modeltype
```

Related commands [atmf guest-class](#)
[switchport atmf-guestlink](#)
[show atmf links guest](#)

Command changes Version 5.4.9-2.1: **onvif** parameter added

service atmf-application-proxy

Overview Use this command to enable the AMF Application Proxy service. This service distributes messages across all AMF nodes.

Currently this is used for threat protection. When an AMF Security (AMF-Sec) Controller detects a threat, it issues a request to block the address the threat originated from. The AMF Application Proxy service distributes this message to all AMF nodes. An AMF master accepts this block request and instructs the subordinate AMF node to block the relevant device.

Use the **no** variant of this command to disable the AMF Application Proxy service.

Syntax service atmf-application-proxy
no service atmf-application-proxy

Default The AMF Application Proxy service is disabled by default.

Mode Global Configuration

Usage notes The AMF master maintains a list of all threats and will send this list to any AMF node, or VCS member, when it boots and joins the AMF network.

In order for this to work the follow must be configured:

- the AMF Application Proxy service on all AMF nodes that need to receive the messages.
- the Hypertext Transfer Protocol (HTTP) service on all nodes that are running the AMF Application Proxy service (see [service http](#)).

Example To enable the AMF Application Proxy service, use the commands

```
awplus# configure terminal  
awplus(config)# service atmf-application-proxy
```

To disable the AMF Application Proxy service, use the commands

```
awplus# configure terminal  
awplus(config)# no service atmf-application-proxy
```

Related commands [application-proxy threat-protection](#)
[application-proxy whitelist server](#)
[clear application-proxy threat-protection](#)
[show application-proxy threat-protection](#)

Command changes Version 5.4.7-2.2: command added

show application-proxy threat-protection

Overview Use this command to list all the IP addresses blocked by the AMF Application Proxy service. It also shows the global threat-detection configuration.

Syntax show application-proxy threat-protection [all]

Parameter	Description
all	Include information for non-local blocks.

Mode Privileged Exec

Example To list the addresses blocked by the AMF Application Proxy service, use the command:

```
awplus# show application-proxy threat-protection
```

Output The following shows typical output.

Example output from show application-proxy threat-protection

```
awplus#show application-proxy threat-protection
Quarantine Vlan      : vlan200
Global IP-Filter     : Enabled
IP-Filter Limit Exceeded : 0
Redirect-URL         : http://my.dom/help.html

Client IP      Interface      MAC Address      VLAN      Action
-----
10.34.199.110  -                          -          -          link-down
10.34.199.116  port1.0.3  001a.eb93.ec5d  1          drop
10.1.179.1     *                          *          *          ip-filter
...
```

Parameters in the output from show application-proxy threat-protection

Parameter	Description
Quarantine Vlan	The name of the quarantine VLAN.
Global IP-Filter	The status of global IP filtering.
IP-Filter Limit Exceeded	The number of times an ACL failed to be installed due to insufficient space.
Redirect-URL	The URL a blocked user is redirected to.

Related commands [application-proxy quarantine-vlan](#)
[application-proxy threat-protection](#)
[clear application-proxy threat-protection](#)
[service atmf-application-proxy](#)

Command changes Version 5.4.7-2.2: command added

show application-proxy whitelist advertised-address

Overview Use this command to show the Layer 3 interface and its IPv4 address that is advertised as the application-proxy whitelist address.

Syntax show application-proxy whitelist advertised-address

Mode Privileged Exec

Example To display the interface and IPv4 address advertised as the application-proxy whitelist address, use the command:

```
awplus# show application-proxy whitelist advertised-address
```

Output The following shows typical output.

Example output from show application-proxy whitelist advertised-address

```
awplus#show application-proxy whitelist advertised-address
ATMF Application Proxy Whitelist advertised-address:
  Interface   : vlan1001
  IP address  : 10.34.16.5
```

Related commands [application-proxy whitelist advertised-address](#)
[application-proxy whitelist server](#)

Command changes Version 5.4.9-1.1: command added

show application-proxy whitelist interface

Overview Use this command to display the status of port authentication on the specified interface.

Syntax show application-proxy whitelist interface [*<interface-list>*]

Parameter	Description
<i><interface-list></i>	The interfaces or ports to display information about. An interface-list can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list. The specified interface must exist.

Mode Privileged Exec

Example To display the port authentication information for all interfaces, use the command:

```
awplus# show application-proxy whitelist interface
```

To display the port authentication information for port1.0.4, use the command

```
awplus# show application-proxy whitelist interface port1.0.4
```

Output The following shows typical output.

Example output from show application-proxy whitelist interface

```
awplus#sh application-proxy whitelist interface
Authentication Info for interface port1.0.1
  portEnabled: false - portControl: Auto
  portStatus: Unknown
  reAuthenticate: disabled
  reAuthPeriod: 3600
  PAE: quietPeriod: 60 - maxReauthReq: 2 - txPeriod: 30
  PAE: connectTimeout: 30
  BE: suppTimeout: 30 - serverTimeout: 30
  CD: adminControlledDirections: in
  KT: keyTxEnabled: false
  critical: disabled
  guestVlan: disabled
  guestVlanForwarding:
    none
  authFailVlan: disabled
  dynamicVlanCreation: disabled
  multiVlanSession: disabled
  hostMode: single-host
  dot1x: disabled
  authMac: enabled
    method: PAP
    scheme: mac
    reauthRelearning: disabled
  authWeb: disabled
  twoStepAuthentication:
    configured: disabled
    actual: disabled
  supplicantMac: none
  supplicantIpv4: none
Authentication Info for interface port1.0.2
...
```

Related commands [application-proxy whitelist enable](#)
[application-proxy whitelist server](#)
[show application-proxy whitelist server](#)
[show application-proxy whitelist supplicant](#)

Command changes Version 5.4.9-0.1: command added

show application-proxy whitelist server

Overview Use this command to display the external RADIUS server details for the application-proxy whitelist feature.

Syntax show application-proxy whitelist server

Mode Privileged Exec

Example To display the external RADIUS server details for the application-proxy whitelist feature, use the command:

```
awplus# show application-proxy whitelist server
```

Output The following shows typical output.

Example output from show application-proxy whitelist server

```
awplus#show application-proxy whitelist server
Application Proxy Whitelist Details:
External Server Details:
  IP: 192.168.1.10
  Port: 2083
  Protection: TLS
  Trustpoint: None (Authentication disabled)
Proxy Details:
  IP: 172.31.0.5
  Status: Alive
```

Related commands [application-proxy whitelist enable](#)
[application-proxy whitelist server](#)
[show application-proxy whitelist interface](#)
[show application-proxy whitelist supplicant](#)

Command changes Version 5.4.9-0.1: command added

show application-proxy whitelist supplicant

Overview Use this command to display the current configuration and status for each supplicant attached to an application-proxy whitelist port.

Syntax show application-proxy whitelist supplicant [*interface* *<interface-list>* | *<mac-addr>* | *brief*]

Parameter	Description
<i>interface</i> <i><interface-list></i>	The interfaces or ports to display information about. An interface-list can be: • a switchport (e.g. port1.0.4) • a static channel group (e.g. sa2) • a dynamic (LACP) channel group (e.g. po2) • a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4) • a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list. The specified interface must exist.
<i><mac-addr></i>	MAC (hardware) address of the supplicant.Entry format is HHHH.HHHH.HHHH (hexadecimal)
<i>brief</i>	Brief summary of the supplicant state.

Mode Privileged Exec

Example To display the supplicant information for all ports, use the command:

```
awplus# show application-proxy whitelist supplicant
```

To display the supplicant information for port1.0.4, use the command:

```
awplus# show application-proxy whitelist supplicant  
interface port1.0.4
```

Output The following shows typical output.

Example output from show application-proxy whitelist supplicant

```
awplus#show application-proxy whitelist supplicant
Interface port1.0.4
  authenticationMethod: dot1x/mac/web
  Two-Step Authentication
    firstMethod: mac
    secondMethod: dot1x/web
  totalSupplicantNum: 1
  authorizedSupplicantNum: 1
    macBasedAuthenticationSupplicantNum: 0
    dot1xAuthenticationSupplicantNum: 0
    webBasedAuthenticationSupplicantNum: 1
    otherAuthenticationSupplicantNum: 0

  Supplicant name: test
  Supplicant address: 001c.233e.e15a
  authenticationMethod: WEB-based Authentication
  Two-Step Authentication:
    firstAuthentication: Pass - Method: mac
    secondAuthentication: Pass - Method: web
  portStatus: Authorized - currentId: 1
  abort:F fail:F start:F timeout:F success:T
  PAE: state: Authenticated - portMode: Auto
  PAE: reAuthCount: 0 - rxRespId: 0
  PAE: quietPeriod: 60 - maxReauthReq: 2
  BE: state: Idle - reqCount: 0 - idFromServer: 0
  CD: adminControlledDirections: in operControlledDirections: in
  CD: bridgeDetected: false
  KR: rxKey: false
  KT: keyAvailable: false - keyTxEnabled: false
  RADIUS server group (auth): radius
  RADIUS server (auth): 192.168.1.40
  ...
```

Related commands [application-proxy whitelist enable](#)
[application-proxy whitelist server](#)
[show application-proxy whitelist interface](#)
[show application-proxy whitelist server](#)

Command changes Version 5.4.9-0.1: command added

show atmf

Overview Displays information about the current AMF node.

Syntax `show atmf [summary|tech|nodes|session]`

Parameter	Description
summary	Displays summary information about the current AMF node.
tech	Displays global AMF information.
nodes	Displays a list of AMF nodes together with brief details.
session	Displays information on an AMF session.

Default Only summary information is displayed.

Mode User Exec and Privileged Exec

Usage notes AMF uses internal VLANs to communicate between nodes about the state of the AMF network. Two VLANs have been selected specifically for this purpose. Once these have been assigned, they are reserved for AMF and cannot be used for other purposes

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Example 1 To show summary information on AMF node_1 use the following command:

```
node_1# show atmf summary
```

Output from the show atmf summary command

```
node_1#show atmf summary
ATMF Summary Information:

ATMF Status           : Enabled
Network Name          : Test_network
Node Name              : node_1
Role                   : Master
Restricted login       : Disabled
Current ATMF Nodes    : 3
```

Example 2 To show information specific to AMF nodes use the following command:

```
node_1# show atmf nodes
```

Example 3 The **show amf session** command displays all CLI (Command Line Interface) sessions for users that are currently logged in and running a CLI session.

To display AMF active sessions, use the following command:

```
node_1# show atmf session
```

For example, in the output below, node_1 and node_5 have active users logged in.

Output from the show atmf session command

```
node_1#show atmf session

CLI Session Neighbors

Session ID           : 73518
Node Name            : node_1
PID                  : 7982
Link type            : Broadcast-cli
MAC Address          : 0000.0000.0000
Options              : 0
Our bits             : 0
Link State           : Full
Domain Controller    : 0
Backup Domain Controller : 0
Database Description Sequence Number : 00000000
First Adjacency      : 1
Number Events        : 0
DBE Retransmit Queue Length : 0
DBE Request List Length : 0
Session ID           : 410804
Node Name            : node_5
PID                  : 17588
Link type            : Broadcast-cli
MAC Address          : 001a.eb56.9020
Options              : 0
Our bits             : 0
Link State           : Full
Domain Controller    : 0
Backup Domain Controller : 0
Database Description Sequence Number : 00000000
First Adjacency      : 1
Number Events        : 0
DBE Retransmit Queue Length : 0
DBE Request List Length : 0
```

Example 4 The AMF tech command collects all the AMF commands, and displays them. You can use this command when you want to see an overview of the AMF network.

To display AMF technical information, use the following command:

```
node_1# show atmf tech
```

Output from the show atmf tech command

```
node_1#show atmf tech
ATMF Summary Information:

ATMF Status           : Enabled
Network Name          : ATMF_NET
Node Name              : node_1
Role                   : Master
Current ATMF Nodes    : 8

ATMF Technical information:

Network Name           : ATMF_NET
Domain                 : node_1's domain
Node Depth             : 0
Domain Flags           : 0
Authentication Type     : 0
MAC Address            : 0014.2299.137d
Board ID               : 287
Domain State           : DomainController
Domain Controller       : node_1
Backup Domain Controller : node2
Domain controller MAC   : 0014.2299.137d
Parent Domain          : -
Parent Domain Controller : -
Parent Domain Controller MAC : 0000.0000.0000
Number of Domain Events : 0
Crosslink Ports Blocking : 0
Uplink Ports Waiting on Sync : 0
Crosslink Sequence Number : 7
Domains Sequence Number : 28
Uplink Sequence Number  : 2
Number of Crosslink Ports : 1
Number of Domain Nodes   : 2
Number of Neighbors      : 5
Number of Non Broadcast Neighbors : 3
Number of Link State Entries : 1
Number of Up Uplinks     : 0
Number of Up Uplinks on This Node : 0
DBE Checksum            : 84fc6
Number of DBE Entries    : 0
Management Domain Ifindex : 4391
Management Domain VLAN   : 4091
Management ifindex       : 4392
Management VLAN          : 4092
```

Parameter definitions from the show atmf tech command

Parameter	Definition
ATMF Status	The Node's AMF status, either Enabled or Disabled.
Network Name	The AMF network that a particular node belongs to.
Node Name	The name assigned to a particular node.

Parameter	Definition
Role	The role configured for this AMF device, either Master or Member.
Current ATMF Nodes	The count of AMF nodes in an AMF Network.
Node Address	An address used to access a remotely located node (.atmf).
Node ID	A unique identifier assigned to a Node on an AMF network.
Node Depth	The number of nodes in path from this node to level of the AMF root node. It can be thought of as the vertical depth of the AMF network from a particular node to the zero level of the AMF root node.
Domain State	The state of Node in a Domain in AMF network as Controller/Backup.
Recovery State	The AMF node recovery status. Indicates whether a node recovery is in progress on this device - Auto, Manual, or None.
Management VLAN	The VLAN created for traffic between Nodes of different domain (up/down links). - VLAN ID - In this example VLAN 4092 is configured as the Management VLAN. - Management Subnet - Network prefix for the subnet. - Management IP Address - The IP address allocated for this traffic. - Management Mask - The subnet mask used to create a subnet for this traffic (255.255.128.0).
Domain VLAN	The VLAN assigned for traffic between Nodes of same domain (crosslink). - VLAN ID - In this example VLAN 4091 is configured as the domain VLAN. - Domain Subnet. The subnet address used for this traffic. - Domain IP Address. The IP address allocated for this traffic. - Domain Mask. The subnet mask used to create a subnet for this traffic (255.255.128.0).
Device Type	The Product Series name.
ATMF Master	Whether the node is an AMF master node for its area ('Y' if it is and 'N' if it is not).
SC	The device configuration, one of C - Chassis (SBx8100 Series), S - Stackable (VCS) or N - Standalone.
Parent	The node to which the current node has an active uplink.
Node Depth	The number of nodes in the path from this node to the master node.

Related commands [show atmf detail](#)

show atmf area

Overview Use this command to display information about an AMF area. On AMF controllers, this command displays all areas that the controller is aware of. On remote AMF masters, this command displays the controller area and the remote local area. On gateways, this command displays the controller area and remote master area.

Syntax show atmf area [detail] [<area-name>]

Parameter	Description
detail	Displays detailed information
<area-name>	Displays information about master and gateway nodes in the specified area only.

Mode Privileged Exec

Example 1 To show information about all areas, use the command:

```
controller-1# show atmf area
```

The following figure shows example output from running this command on a controller.

Example output from the show atmf area command on a Controller.

```
controller-1#show atmf area
```

ATMF Area Information:

* = Local area

Area Name	Area ID	Local Gateway	Remote Gateway	Remote Master	Node Count
* NZ	1	Reachable	N/A	N/A	3
Wellington	2	Reachable	Reachable	Auth OK	120
Canterbury	3	Reachable	Reachable	Auth Error	-
SiteA-AREA	14	Unreachable	Unreachable	Unreachable	-
Auckland	100	Reachable	Reachable	Auth Start	-
Southland	120	Reachable	Reachable	Auth OK	54
Area count:	6			Area node count:	177

The following figure shows example output from running this command on a remote master.

Example output from the show atmf area command on a remote master.

```
Canterbury#show atmf area
```

ATMF Area Information:

* = Local area

Area Name	Area ID	Local Gateway	Remote Gateway	Remote Master	Node Count
NZ	1	Reachable	N/A	N/A	-
* Canterbury	3	Reachable	N/A	N/A	40
Area count:	2			Local area node count:	40

Parameter definitions from the show atmf area command

Parameter	Definition
*	Indicates the area of the device on which the command is being run.
Area Name	The name of each area.
Area ID	The ID of the area.
Local Gateway	Whether the local gateway node is reachable or not.
Remote Gateway	Whether the remote gateway node is reachable or not. This is one of the following:

Parameter	Definition
	• Reachable, if the link has been established. • Unreachable, if a link to the remote area has not been established. This could mean that a port or vlan is down, or that inconsistent VLANs have been configured using the switchport atmf-arealink command. • N/A for the area of the controller or remote master on which the command is being run, because the gateway node on that device is local. • Auth Start, which may indicate that the area names match on the controller and remote master, but the IDs do not match. • Auth Error, which indicates that the areas tried to authenticate but there is a problem. For example, the passwords configured on the controller and remote master may not match, or a password may be missing on the remote master.# • Auth OK, which indicates that area authentication was successful and you can now use the atmf select-area command.
Remote Master	Whether the remote master node is reachable or not. This is N/A for the area of the controller or remote master on which the command is being run, because the master node on that device is local.
Node Count	The number of nodes in the area.
Area Count	The number of areas controlled by the controller.
Area Node Count	The total number of nodes in the area.

Example 2 To show detailed information about the areas, use the command:

```
controller-1# show atmf area detail
```

The following figure shows example output from running this command.

Output from the show atmf area detail command

```
controller-1#show atmf area detail

ATMF Area Detail Information:

Controller distance      : 0

Controller Id           : 21
Backup Available        : FALSE

Area Id                 : 2
Gateway Node Name       : controller-1
Gateway Node Id         : 342
Gateway Ifindex         : 6013
Masters Count           : 1
Master Node Name        : well-master (329)
Node Count              : 2

Area Id                 : 3
Gateway Node Name       : controller-1
Gateway Node Id         : 342
Gateway Ifindex         : 4511
Masters Count           : 2
Master Node Name        : cant1-master (15)
Master Node Name        : cant2-master (454)
Node Count              : 2
```

Related commands [show atmf area summary](#)
[show atmf area nodes](#)
[show atmf area nodes-detail](#)

show atmf area guests

Overview This command will display details of all guests that the controller is aware of.

Syntax show atmf area guests [*<area-name>*] [*<node-name>*]

Parameter	Description
<i><area-name></i>	The area name for guest information
<i><node-name></i>	The name of the node that connects to the guests.

Default n/a

Mode User Exec/Privileged Exec

Example 1 To display atmf area guest nodes on a controller, use the command,
GuestNode[1]#show atmf area guests

Output The following shows typical output.

Example output from the show atmf area guests command

main-building Area Guest Node Information:				
Device Type	MAC Address	Parent	Port	IP/IPv6 Address
-	0008.5d10.7635	x230	1.0.3	192.168.5.4
AT-TQ4600	eccd.6df2.da60	wireless-node1	1.0.4	192.168.5.3
-	0800.239e.f1fe	x230	1.0.4	192.168.4.8
AT-TQ4600	001a.eb3b.dc80	wireless-node2	1.0.7	192.168.4.12
main-building guest node count 4				
GuestNode[1]#				

Parameters in the output from show atmf area guests command

Parameter	Description
Device Type	The device type as read from the guest node.
MAC Address	The MAC address of the guest-node
Parent	The device that directly connects to the guest-node
Port	The port number on the parent node that connects to the guest node.
IP/IPv6	The IP or IPv6 address of the guest node.

Related
commands

- show atmf area**
- show atmf area nodes**
- show atmf backup guest**
- show atmf area guests-detail**

show atmf area guests-detail

Overview This command displays the local and remote guest information from an AMF controller.

Syntax show atmf area guests-detail [*<area-name>*] [*<node-name>*]

Parameter	Description
<i><area-name></i>	The name assigned to the AMF area. An area is an AMF network that is under the control of an AMF Controller.
<i><node-name></i>	The name assigned to the network node.

Mode Privileged Exec

Example To display detailed information for all guest nodes attached to “node1”, which is located within the area named “northern”, use the following command:

```
AMF_controller#show atmf area guests-detail northern node1
```

Output The following shows typical output.

Example output from the show atmf guest detail command.

```
#show atmf guest detail

Node Name           : Node1
Port Name           : port1.0.5
Ifindex             : 5005
Guest Description    : tq4600
Device Type         : AT-TQ4600
Configuration Mismatch : No
Backup Supported     : Yes
MAC Address         : eccd.6df2.da60
IP Address          : 192.168.4.50
IPv6 Address        : Not Set
HTTP Port           : 80
Firmware Version    :

Node Name           : poe
Port Name           : port1.0.6
Ifindex             : 5006
Guest Description    : tq3600
Device Type         : AT-TQ2450
Configuration Mismatch : No
Backup Supported     : Yes
MAC Address         : 001a.eb3b.cb80
IP Address          : 192.168.4.9
IPv6 Address        : Not Set
HTTP Port           : 80
Firmware Version    :
```

Parameters shown in the output of the show atmf guest detail command

Parameter	Description
Node Name	The name of the guest's parent node.
Port Name	The port on the parent node that connects to the guest.
Ifindex	An internal index number that maps to the port number on the parent node.
Guest Description	A brief description of the guest node as manually entered into the description (interface) command for the guest node port on the parent node.
Device Type	The device type as supplied by the guest node itself.
Backup Supported	Indicates whether AMF supports backup of this guest node.
MAC Address	The MAC address of the guest node.
IP Address	The IP address of the guest node.
IPv6 Address	The IPv6 address of the guest node.
HTTP Port	The HTTP port enables you to specify a port when enabling http to allow a URL for the http user

Parameter	Description
	interface of a Guest Node. This is determined by the http-enable command.
Firmware Version	The firmware version that the guest node is currently running.

Related commands **show atmf area nodes-detail**
show atmf area guests

show atmf area nodes

Overview Use this command to display summarized information about an AMF controller's remote nodes.

Note that this command can only be run from a controller node.

Syntax show atmf area nodes *<area-name>* [*<node-name>*]

Parameter	Description
<i><area-name></i>	Displays information about nodes in the specified area.
<i><node-name></i>	Displays information about the specified node.

Mode Privileged Exec

Usage notes If you do not limit the output to a single area or node, this command lists all remote nodes that the controller is aware of. This can be a very large number of nodes.

Example To show summarized information for all the nodes in area 'Wellington', use the command:

```
controller-1# show atmf area nodes Wellington
```

The following figure shows partial example output from running this command.

Output from the show atmf area nodes Wellington command

```
controller-1#show atmf area nodes Wellington
```

Wellington Area Node Information:					
Node Name	Device Type	ATMF Master	SC	Parent Domain	Node Depth
well-gate	x230-18GP	N	N	well-master	1
well-master	AT-x930-28GPX	Y	N	none	0

Wellington node count 2

Parameter definitions from the show atmf area nodes command

Parameter	Definition
Node Name	The name assigned to a particular node.
Device Type	The Product series name.
ATMF Master	Whether the node is an AMF master node for its area ('Y' if it is and 'N' if it is not).
SC	The device configuration, one of C - Chassis (SBx8100 series), S - Stackable (VCS) or N - Standalone.
Parent Domain	The node to which the current node has an active uplink.
Node Depth	The number of nodes in the path from this node to the master node.

Related commands [show atmf area](#)
[show atmf area nodes-detail](#)

show atmf area nodes-detail

Overview Use this command to display detailed information about an AMF controller's remote nodes.

Note that this command can only be run from a controller node.

Syntax show atmf area nodes-detail *<area-name>* [*<node-name>*]

Parameter	Description
<i><area-name></i>	Displays detailed information about nodes in the specified area.
<i><node-name></i>	Displays detailed information about the specified node.

Mode Privileged Exec

Usage notes If you do not limit the output to a single area or node, this command displays information about all remote nodes that the controller is aware of. This can be a very large number of nodes.

Example To show information for all the nodes in area 'Wellington', use the command:

```
controller-1# show atmf area nodes-detail Wellington
```

The following figure shows partial example output from running this command.

Output from the show atmf area nodes-detail Wellington command

```
controller-1#show atmf area nodes-detail Wellington

Wellington Area Node Information:
Node name well-gate
Parent node name : well-master
Domain id       : well-gate's domain
Board type      : 368
Distance to core : 1
Flags           : 50
Extra flags     : 0x00000006
MAC Address     : 001a.eb56.9020

Node name well-master
Parent node name : none
Domain id       : well-master's domain
Board type      : 333
Distance to core : 0
Flags           : 51
Extra flags     : 0x0000000c
MAC Address     : eccd.6d3f.fef7

...
```

Parameter definitions from the show atmf area nodes-detail command

Parameter	Definition
Node name	The name assigned to a particular node.
Parent node name	The node to which the current node has an active uplink.
Domain id	The name of the domain the node belongs to.
Board type	The Allied Telesis code number for the device.
Distance to core	The number of nodes in the path from the current node to the master node in its area.
Flags	Internal AMF information
Extra flags	Internal AMF information
MAC Address	The MAC address of the current node

Related commands [show atmf area](#)
[show atmf area nodes](#)

show atmf area summary

Overview Use this command to display a summary of IPv6 addresses used by AMF, for one or all of the areas controlled by an AMF controller.

Syntax show atmf area summary [*<area-name>*]

Parameter	Description
<i><area-name></i>	Displays information for the specified area only.

Mode Privileged Exec

Example 1 To show a summary of IPv6 addresses used by AMF, for all of the areas controlled by controller-1, use the command:

```
controller-1# show atmf area summary
```

The following figure shows example output from running this command.

Output from the show atmf area summary command

```
controller-1#show atmf area summary

ATMF Area Summary Information:

Management Information
  Local IPv6 Address           : fd00:4154:4d46:1::15

Area Information
  Area Name                   : NZ (Local)
  Area ID                     : 1
  Area Master IPv6 Address    : -

  Area Name                   : Wellington
  Area ID                     : 2
  Area Master IPv6 Address    : fd00:4154:4d46:2::149

  Area Name                   : Canterbury
  Area ID                     : 3
  Area Master IPv6 Address    : fd00:4154:4d46:3::f

  Area Name                   : Auckland
  Area ID                     : 100
  Area Master IPv6 Address    : fd00:4154:4d46:64::17
  Interface                   : vlink2000
```

Related commands [show atmf area](#)
[show atmf area nodes](#)
[show atmf area nodes-detail](#)

show atmf authorization

Overview Use this command on an AMF master to display the authorization status of other AMF members and masters on the network.

On an AMF controller this command will show the authorization status of remote area AMF masters.

Syntax `show atmf authorization {current|pending|provisional}`

Parameter	Description
current	Show the status of all authorized nodes.
pending	Show the status of unauthorized nodes in the pending queue. These are nodes that enabled secure mode with atmf secure-mode but have not yet been authorized with atmf authorize .
provisional	Show the status of provisionally authorized nodes. These are nodes that have been provisioned with atmf authorize provision .

Mode Privileged Exec

Example To display all authorized AMF nodes on an AMF controller or AMF master, use the command:

```
awplus# show atmf authorization current
```

To display AMF nodes which are requesting authorization on an AMF controller or AMF master, use the command:

```
awplus# show atmf authorization pending
```

To display AMF nodes which have provisional authorization, use the command:

```
awplus# show atmf authorization provisional
```

Output The following shows typical output.

Example output from show atmf authorization current

NZ Authorized Nodes:		
Node Name	Signer	Expires

master_1	master_1	4 Mar 2017
area_1_node_1	master_1	4 Mar 2017
area_1_node_2	master_1	4 Mar 2017

Parameters in the output from show atmf authorization current

Parameter	Description
Node Name	AMF node name of the authorized node.
Signer	Name of the AMF master that authorized the node.
Expires	Expiry date of the authorization. Authorization expiry time is set using atmf secure-mode certificate expiry .

Output The following shows typical output.

Example output from show atmf authorization pending

Pending Authorizations:			
NZ Requests:			
Node Name	Product	Parent Node	Interface

area_1_node_3	x230-18GP	master_1	port1.2.9
area_1_node_4	x510-52GTX	master_1	sa1

Parameters in the output from show atmf authorization pending

Parameter	Description
Node Name	Name of the node that is requesting authorization.
Product	Product name.
Parent Node	Authorization authority of the requesting node.
Interface	Interface that the authorization request came in on.

Output The following shows typical output.

Example output from show atmf authorization provisional

ATMF Provisional Authorization:			
Area - Node Name or MAC Address	Interface	Start Time	Timeout Minutes
3333.4444.5555		5 Sep 2016 02:35:54	3
1111.2222.3333		5 Sep 2016 02:35:24	60
NZ - blue	port1.0.3	5 Sep 2016 02:35:06	60

Parameters in the output from show atmf authorization provisional

Parameter	Description
Area - Node Name or MAC Address	MAC address or node name of the node that has been provisionally authorized.
Interface	Interface that the node has been provisioned on.
Start Time	Time the node was provisioned.
Timeout Minutes	Length of time from Start Time until the provisional authorization expires.

Related commands

- [atmf authorize](#)
- [atmf authorize provision](#)
- [atmf secure-mode](#)
- [clear atmf secure-mode certificates](#)
- [show atmf](#)
- [show atmf secure-mode](#)
- [show atmf secure-mode certificates](#)

Command changes Version 5.4.7-0.3: command added

show atmf backup

Overview This command displays information about AMF backup status for all the nodes in an AMF network. It can only be run on AMF master and controller nodes.

Syntax show atmf backup
show atmf backup logs
show atmf backup server-status
show atmf backup synchronize [logs]

Parameter	Description
logs	Displays detailed log information.
server-status	Displays connectivity diagnostics information for each configured remote file server.
synchronize	Display the file server synchronization status
logs	For each remote file server, display the logs for the last synchronization

Mode Privileged Exec

Example 1 To display the AMF backup information, use the command:

```
node_1# show atmf backup
```

To display log messages to do with backups, use the command:

```
node_1# show atmf backup logs
```

Output from show atmf backup

```
Node_1# show atmf backup
ScheduledBackup .....Enabled
  Schedule.....1 per day starting at 03:00
  Next Backup Time...04 May 2019 03:00
Backup Bandwidth .....Unlimited
Backup Media.....SD (Total 1974.0 MB, Free197.6MB)
Current Action.....Starting manual backup
Started.....04 May 2019 10:08
CurrentNode.....atmf_testbox1
Backup Redundancy ....Enabled
  Local media .....SD (Total 3788.0MB, Free 3679.5MB)
  State .....Active
```

Node Name	Date	Time	In ATMF	On Media	Status
atmf_testbox1	04 May 2019	09:58:59	Yes	Yes	In Progress
atmf_testbox2	04 May 2019	10:01:23	Yes	Yes	Good

Output from show atmf backup logs

```
Node_1#show atmf backup logs

Backup Redundancy ..... Enabled
Local media ..... SD (Total 3788.0MB, Free 1792.8MB)
State ..... Inactive (Remote file server is not available)

Log File Location: card:/atmf/ATMF/logs/rsync_<node name>.log

Node
Name Log Details
-----
atmf_testbox
2019/05/04 18:16:51 [9045] receiving file list
2019/05/04 18:16:51 [9047] .d..t.... flash/
2019/05/04 18:16:52 [9047] >f+++++++ flash/a.rel
```

Example 2 To display the AMF backup synchronization status, use the command:

```
node_1# show atmf backup synchronize
```

To display log messages to do with synchronization of backups, use the command:

```
node_1# show atmf backup synchronize logs
```

Output from show atmf backup synchronize

```
Node_1#show atmf backup synchronize
ATMF backup synchronization:
* = Active file server

  Id   Date           Time           Status
-----
  1    04 May 2016     22:25:57     Synchronized
* 2    -               -             Active
```

Output from show atmf backup synchronize logs

```
Node_1#show atmf backup synchronize logs

Id     Log Details
-----
1      2019/05/04 22:25:54 [8039] receiving file list
      2019/05/04 22:25:54 [8039] >f..t.... backup_Box1.info
      2019/05/04 22:25:54 [8039] sent 46 bytes received 39 bytes total size 40
```

Example 3 To display the AMF backup information with the optional parameter **server-status**, use the command:

```
Node_1# show atmf backup server-status
```

```
Node1#sh atmf backup server-status

Id     Last Check      State
-----
1      186 s           File server ready
2      1 s             SSH no route to host
```


Parameter definitions from the show atmf backup command

Parameter	Definition
Scheduled Backup	Indicates whether AMF backup scheduling is enabled or disabled.
Schedule	Displays the configured backup schedule.
Next Backup Time	Displays the date and time of the next scheduled.
Backup Media	The current backup medium in use. This will be one of USB, SD, or NONE. Utilized and available memory (MB) will be indicated if backup media memory is present.
Current Action	The task that the AMF backup mechanism is currently performing. This will be a combination of either (Idle, Starting, Doing, Stopping), or (manual, scheduled).
Started	The date and time that the currently executing task was initiated in the format DD MMM YYYY HH:MM
Current Node	The name of the node that is currently being backed up.
Backup Redundancy	Whether backup redundancy is enabled or disabled.
Local media	The local media to be used for backup redundancy; SD, USB, INTERNAL, or NONE, and total and free memory available on the media.
State	Whether SD or USB media is installed and available for backup redundancy. May be Active (if backup redundancy is functional—requires both the local redundant backup media and a remote server to be configured and available) or Inactive.
Node Name	The name of the node that is storing backup data - on its backup media.
Date	The data of the last backup in the format DD MMM YYYY.
Time	The time of the last backup in the format HH:MM:SS.
In ATMF	Whether the node shown is active in the AMF network, (Yes or No).
On Media	Whether the node shown has a backup on the backup media (Yes or No).
Status	The output can contain one of four values: • “-” meaning that the status file cannot be found or cannot be read. • “Errors” meaning that there are issues - note that the backup may still be deemed successful depending on the errors. • “Stopped” meaning that the backup attempt was manually aborted. • “Good” meaning that the backup was completed successfully. • “In Progress” meaning that the backup is currently running on that node.

Parameter	Definition
Log File Location	All backup attempts will generate a result log file in the identified directory based on the node name. In the above example this would be: card:/amf/office/logs/rsync_amf_testbox1.log.
Log Details	The contents of the backup log file.
server-status	Displays connectivity diagnostics information for each configured remove file server.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Related commands [show atmf](#)
[atmf network-name](#)

show atmf backup area

Overview Use this command to display backup status information for the master nodes in one or more areas.

Note that this command is only available on AMF controllers.

Syntax show atmf backup area [*<area-name>*] [*<node-name>*] [logs]

Parameter	Description
logs	Displays the logs for the last backup of each node.
<i><area-name></i>	Displays information about nodes in the specified area.
<i><node-name></i>	Displays information about the specified node.

Mode Privileged Exec

Example To show information about backups for an area, use the command:

```
controller-1# show atmf backup area
```

Output from the show atmf backup area command

```
controller-1#show atmf backup area
Scheduled Backup ..... Enabled
Schedule ..... 12 per day starting at 14:30
Next Backup Time .... 15 Oct 2016 04:30
Backup Bandwidth ..... Unlimited
Backup Media ..... FILE SERVER 1 (Total 128886.5MB, Free 26234.2MB)
Server Config .....
* 1 ..... Configured (Mounted, Active)
  Host ..... 10.37.74.1
  Username ..... root
  Path ..... /tftpboot/backups_from_controller-1
  Port ..... -
  2 ..... Configured (Unmounted)
  Host ..... 10.37.142.1
  Username ..... root
  Path ..... -
  Port ..... -
Current Action ..... Idle
Started ..... -
Current Node ..... -

Backup Redundancy ..... Enabled
Local media ..... USB (Total 7604.0MB, Free 7544.0MB)
State ..... Active
```

Area Name	Node Name	Id	Date	Time	Status
Wellington	camry	1	14 Oct 2016	02:30:22	Good
Canterbury	corona	1	14 Oct 2016	02:30:23	Good
Canterbury	Avensis	1	14 Oct 2016	02:30:22	Good
Auckland	RAV4	1	14 Oct 2016	02:30:23	Good
Southland	MR2	1	14 Oct 2016	02:30:24	Good

Related commands **atmf backup area-masters enable**

show atmf area

show atmf area nodes-detail

switchport atmf-area link

show atmf backup guest

Overview This command displays backup status information of guest nodes in an AMF network. This command can only be run on a device configured as an AMF Master and has an AMF guest license.

Syntax `show atmf backup guest [<node-name> [<guest-port>]] [logs]`

Parameter	Description
<code><node-name></code>	The name of parent guest node
<code><guest-port></code>	The port number on the parent node

Mode User Exec/Privileged Exec

Example On the switch named x930-master, to display information about the AMF backup guest status, use the command:

```
x930-master# show atmf backup guest
```

Output The following shows typical output.

Example output from show atmf backup guest

```
x930-master#sh atmf backup guest
Guest Backup ..... Enabled
Scheduled Backup ..... Disabled
  Schedule ..... 1 per day starting at 03:00
  Next Backup Time .... 20 Jan 2016 03:00
Backup Bandwidth ..... Unlimited
Backup Media ..... FILE SERVER 2 (Total 655027.5MB,
                          Free 140191.5MB)

Server Config
1 ..... Configured (Mounted)
Host ..... 11.0.24.1
Username ..... bob
Path ..... guest-project
Port ..... -
* 2 ..... Configured (Mounted, Active)
Host ..... 11.0.24.1
Username ..... bob
Path ..... guest-project-second
Port.....-

Current Action .....Idle
Started ..... -
Current Node ..... -
Backup Redundancy ....Enabled
Local media ..... USB (Total 7376.0MB, Free 7264.1MB)
State ..... Active

Parent Node Name      Port Name      Id      Date          Time          Status
-----
x230                  port1.0.4      2       19 Jan 2016   22:21:46      Good
                      1             19 Jan 2016   22:21:46      Good
                      USB           19 Jan 2016   22:21:46      Good
```

Parameters in the output from show atmf backup guest

Parameter	Description
Guest Backup	The status of the guest node backup process
Scheduled Backup	The timing configured for guest backups.
Schedule	Displays the configured backup schedule.
Next Backup Time	The time the next backup process will be initiated.
Backup Bandwidth	The bandwidth limit applied to the backup data flow measured in kilo Bytes /second. Note that unlimited means there is no limit set specifically for the backup data flow.
Backup Media	Detail of the memory media used to store the backup files and the current memory capacity available.

Related commands

- show atmf backup area**
- show atmf backup**
- show atmf links guest**
- show atmf nodes**
- show atmf backup guest**
- atmf backup guests delete**
- atmf backup guests enable**

show atmf container

Overview Use this command to display information about the AMF containers created on a Virtual AMF Appliance (VAA).

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Syntax show atmf container [detail] [<container-name>]

Parameter	Description
detail	Show detailed information.
<container-name>	The name of the AMF container you wish to display information for.

Mode Privileged Exec

Output The following shows typical output.

Example output from show atmf container

```
awplus#show atmf container

ATMF Container Information:

  Container      Area      Bridge  State      Memory      CPU%
-----
vac-wlg-1       wlg       br1     running    70.3 MB     1.2
vac-akl-1       ak1       br2     stopped    0 bytes     0.0
vac-nsn-1       nsn       br3     running    53.2 MB     0.7

Current ATMF Container count: 3
```

Example output from show atmf container vac-wlg-1

```
awplus#show atmf container vac-wlg-1

ATMF Container Information:

  Container      Area      Bridge  State      Memory      CPU%
-----
vac-wlg-1       wlg       br1     running    70.3 MB     1.2

Current ATMF Container count: 1
```

Parameters in the output from show atmf container

Parameter	Description
Container	Name of the AMF container.
Area	Name of the area the container is in.
Bridge	Name of the bridge connecting the container to the physical network.
State	Container state, running or stopped. This is set with the state command.
Memory	The amount of memory the container is using on the VAA host.
CPU%	The percentage of CPU time the container is using on the VAA, at the time the show command is run.

Example output from show atmf container detail vac-wlg-1

```
awplus#show atmf container detail vac-wlg-1

ATMF Container Information:

Name: vac-wlg-1
State: RUNNING
PID: 980
IP: 172.31.0.1
IP: 192.168.0.2
IP: fd00:4154:4d46:3c::1
CPU use: 3.95 seconds
Memory use: 67.07 MiB
```

```
Memory use: 0 bytes
Link: vethP31UFA
TX bytes: 166.01 KiB
RX bytes: 141.44 KiB
Total bytes: 307.45 KiB
Link: vethYCT7BB
TX bytes: 674.27 KiB
RX bytes: 698.27 KiB
Total bytes: 1.34 MiB
```

Parameters in the output from show atmf container detail

Parameter	Description
Name	Name of the AMF container.
State	Container state, RUNNING or STOPPED. This is set with the state command.
PID	Internal container id.
IP	This lists the IP addresses used by the container. These include the eth1 IP address and the AMF management IP address.
CPU use	The CPU usage of the container since it was enabled.
Memory use	Container memory usage.
Link	Each container has two links: 1. An AMF area-link, this connects the container to the AMF controller and uses virtual interface eth0 on the AMF container. 2. A bridged L2 network link, this connects the container to the outside world and uses the virtual interface eth1 on the AMF container. See the AMF Feature Overview and Configuration_Guide for more information on these links.
TX/RX bytes	Bytes sent and received on a link.
Total bytes	Total bytes transferred on a link.

Related commands

- [area-link](#)
- [atmf area](#)
- [atmf area password](#)
- [atmf container](#)
- [atmf container login](#)
- [bridge-group \(amf-container\)](#)
- [description \(amf-container\)](#)
- [state](#)

Command changes Version 5.4.7-0.1: command added

show atmf detail

Overview This command displays details about an AMF node. It can only be run on AMF master and controller nodes.

Syntax show atmf detail

Parameter	Description
detail	Displays output in greater depth.

Mode Privileged Exec

Example 1 To display the AMF node1 information in detail, use the command:

```
controller-1# show atmf detail
```

A typical output screen from this command is shown below:

```
atmf-1#show atmf detail
ATMF Detail Information:

Network Name           : Test_network
Network Mtu            : 1300
Node Name              : controller-1
Node Address           : controller-1.atmf
Node ID                : 342
Node Depth             : 0
Domain State           : BackupDomainController
Recovery State         : None
Recovery Over ETH Ports : Disabled
Log Verbose Setting    : Verbose
Topology GUI           : Disabled

Management VLAN
VLAN ID                : 4000
Management Subnet      : 172.31.0.0
Management IP Address  : 172.31.1.86
Management Mask        : 255.255.128.0
Management IPv6 Address : fd00:4154:4d46:1::156
Management IPv6 Prefix Length : 64

Domain VLAN
VLAN ID                : 4091
Domain Subnet          : 172.31.128.0
Domain IP Address      : 172.31.129.86
Domain Mask            : 255.255.128.0
```

Parameter definitions from the show atmf detail command

Parameter	Definition
Network MTU	The network MTU for the ATMF network.
Network Name	The AMF network that a particular node belongs to.
Node Name	The name assigned to a particular node.
Node Address	An address used to access a remotely located node. This is simply the Node Name plus the dotted suffix atmf (.atmf).
Node ID	A unique identifier assigned to a node on an AMF network.
Node Depth	The number of nodes in the path from this node to the level of the AMF root node. It can be thought of as the vertical depth of the AMF network from a particular node to the zero level of the AMF root node.
Domain State	The state of a node in a Domain in an AMF network as Controller/Backup.
Recovery State	The AMF node recovery status. Indicates whether a node recovery is in progress on this device - Auto, Manual, or None.

Parameter	Definition
Recovery Over ETH Ports	Allow AMF recovery over the Eth port on an AR-series device.
Log Verbose Setting	The state of the atmf log-verbose command.
Topology GUI	This feature allows your AMF network to interact with Vista Manager EX and must be enabled on your AMF master.
Management VLAN	The VLAN created for traffic between nodes of different domain (up/down links). • VLAN ID - in this example VLAN 4092 is configured as the Management VLAN. • Management Subnet - the network prefix for the subnet. • Management IP Address - the IP address allocated for this traffic. • Management Mask - the subnet mask used to create a subnet for this traffic (255.255.128.0).
Domain VLAN	The VLAN assigned for traffic between nodes of the same domain (crosslink). • VLAN ID - in this example VLAN 4091 is configured as the domain VLAN. • Domain Subnet - the subnet address used for this traffic. • Domain IP Address - the IP address allocated for this traffic. • Domain Mask - the subnet mask used to create a subnet for this traffic (255.255.128.0).
Node Depth	The number of nodes in the path from this node to the core domain.

show atmf group

Overview This command can be used to display the group membership within to a particular AMF node. It can also be used with the working-set command to display group membership within a working set.

Each node in the AMF is automatically added to the group that is appropriate to its hardware architecture, e.g. x510, x230. Nodes that are configured as masters are automatically assigned to the master group.

You can create arbitrary groups of AMF members based on your own selection criteria. You can then assign commands collectively to any of these groups.

Syntax show atmf group [user-defined|automatic]

Parameter	Description
user-defined	User-defined-group information display.
automatic	Automatic group information display.

Default All groups are displayed

Mode Privileged Exec

Example 1 To display group membership of node2, use the following command:

```
node2# show atmf group
```

A typical output screen from this command is shown below:

```
ATMF group information
master, x510
node2#
```

This screen shows that node2 contains the groups **master** and **x510**. Note that although the node also contains the implicit groups, these do not appear in the show output.

Example 2 The following commands (entered on *node2*) will display all the automatic groups within the working set containing *node1* and all nodes that have been pre-defined to contain the *sysadmin* group:

First define the working-set:

```
node1# #atmf working-set node1 group sysadmin
```

A typical output screen from this command is shown below:

```
ATMF group information
master, poe, x8100

=====
node1, node2, node3, node4, node5, node6:
=====

ATMF group information
sysadmin, x8100
AMF_NETWORK[6]#
```

This confirms that the six nodes (*node1* to *node6*) are now members of the working-set and that these nodes reside within the *AMF-NETWORK*.

Note that to run this command, you must have previously entered the command **atmf working-set**. This can be seen from the network level prompt, which in this case is *AMF_NETWORK[6]#*.

Sample output from the show atmf group command for a working set.

```
AMF_NETWORK[6]#show atmf group
=====
node3, node4, node5, node6:
=====

ATMF group information
edge_switches, x510
```

Parameter definitions from the show atmf group command for a working set

Parameter	Definition
ATMF group information	Displays a list of nodes and the groups that they belong to, for example: • master - Shows a common group name for Nodes configured as AMF masters. • Hardware Arch - Shows a group for all Nodes sharing a common Hardware architecture, e.g. x8100, x230, for example. • User-defined - Arbitrary groups created by the user for AMF nodes.

show atmf group members

Overview This command will display all group memberships within an AMF working-set. Each node in the AMF working set is automatically added to automatic groups which are defined by hardware architecture, e.g. x510, x230. Nodes that are configured as masters are automatically assigned to the master group. Users can define arbitrary groupings of AMF members based on their own criteria, which can be used to select groups of nodes.

Syntax show atmf group members [user-defined|automatic]

Parameter	Description
user-defined	User defined group membership display.
automatic	Automatic group membership display.

Mode Privileged Exec

Example To display group membership of all nodes in a working-set, use the command:

```
ATMF_NETWORK[9]# show atmf group members
```

Sample output from the show atmf group members command

ATMF Group membership		
Automatic Groups	Total Members	Members

master	1	Building_1
poe	1	HW_Team1
x510	3	SW_Team1 SW_Team2 SW_Team3
x930	1	HW_Team1
x8100	2	Building_1 Building_2
ATMF Group membership		
User-defined Groups	Total Members	Members

marketing	1	Bld1_Floor_1
software	3	SW_Team1 SW_Team2 SW_Team3

Parameter definitions from the show atmf group members command

Parameter	Definition
Automatic Groups	Lists the Automatic Groups and their nodal composition. The sample output shows AMF nodes based on the same Hardware type or belonging to the same Master group.
User-defined Groups	Shows the grouping of AMF nodes in user defined groups.
Total Members	Shows the total number of members in each group.
Members	Shows the list of AMF nodes in each group.

Related commands [show atmf group](#)
[show atmf](#)
[atmf group \(membership\)](#)

show atmf guests

Overview This command is available on any AMF master or controller in the network. It displays a summary of the AMF guest nodes that exist in the AMF network, including device type, parent node, and IP address.

Syntax show atmf guests

Mode User Exec/Privileged Exec

Usage notes Use this command to display all guest nodes in a network. If you want to see only the guests attached to a single node, use the [show atmf links guest](#) command, which shows information about the guest nodes and also about their link to their parent node.

Example To display the AMF guest output, use the command:
awplus# show atmf guests

Output The following shows typical output.

Example output from the show atmf guests command

```
master#show atmf guests

Guest Information:

Device      Device      Parent      Guest      IP/IPv6
Name        Type        Node        Port       Address
-----
node1-2.0.1 x600-24Ts   node1       2.0.1      192.168.2.10
wireless-zone1 AT-TQ4600   node2       1.0.1      192.168.1.10
wireless-zone2 AT-TQ4600   node2       1.0.2      192.168.1.12

Current ATMF guest node count 3
```

Parameters shown in the output of the show atmf guests command

Parameter	Description
Device Name	The name that is discovered from the device, or failing that, a name that is auto-assigned by AMF. The auto-assigned name consists of:<parent node name>-<attached port number>You can change this by configuring a description on the port.
Device Type	The product name of the guest node, which is discovered from the device. If no device type can be discovered, this shows the name of the AMF guest-class that has been assigned to the guest node by the atmf guest-class command.
Parent Node	The name of the AMF node that directly connects to the guest node.
Guest Port	The port on the parent node that directly connects to the guest node.
IP/IPv6 Address	The address discovered from the node, or statically configured on the parent node's attached port.

Related commands **atmf guest-class**
switchport atmf-guestlink
show atmf backup guest
show atmf links guest

show atmf guests detail

Overview This command is available on any AMF master in the network. It displays details about the AMF guest nodes that exist in the AMF network, such as device type, IP address, MAC address etc.

Syntax `show atmf guests detail [<node-name>] [<guest-port>]`

Parameter	Description
<code><node-name></code>	The name of the guest node's parent.
<code><guest-port></code>	The port name on the parent node.

Mode User Exec/Privileged Exec

Usage notes If you want to see only the guests attached to a single node, you can use either:

- this command and specify the node name, or
- **show atmf links guest detail**, which shows information about the guest nodes and also about their link to their parent node.

Note that the parameters that are displayed depend on the guest node's model.

Example To display the AMF guest output, use the command:

```
awplus# show atmf guests detail
```

Output The following shows typical output.

Example output from show atmf guests detail

```
master#show atmf guests detail

ATMF Guest Node Information:

Node Name           : master
Port Name           : port1.0.9
Ifindex             : 5009
Guest Description    : red-1.0.9
Device Type         : x600-24Ts
Backup Supported     : No
MAC Address         : 0000.cd38.0c4d
IP Address          : 192.168.1.5
IPv6 Address        : Not Set
HTTP Port           : 0
Firmware Version    : 5.4.2-0.1

Node Name           : node1
Port Name           : port1.0.13
Ifindex             : 5013
Guest Description    : node1-1.0.13
Device Type         : AT-TQ4600
Backup Supported     : Yes
MAC Address         : eccd.6df2.daa0
IP Address          : 192.168.5.6
IPv6 Address        : Not Set
HTTP Port           : 80
Firmware Version    : 3.1.0 B01
```

Parameters in the output from show atmf guests detail.

Parameter	Description
Node Name	The name of the parent node, which is the AMF node that directly connects to the guest node.
Port Name	The port on the parent node that connects to the guest.
IfIndex	An internal index number that maps to the port number on the parent node.
Guest Description	A description that is discovered from the device, or failing that, auto-assigned by AMF. The auto-assigned name consists of: <parent node name>-<attached port number>. You can change this by configuring a description on the port.
Device Type	The product name of the guest node, which is discovered from the device. If no device type can be discovered, this shows the name of the AMF guest-class that has been assigned to the guest node by the atmf guest-class command.
Username	The user name configured on the guest node.
Backup Supported	Whether the guest node supports AMF backup functionality.

Parameter	Description
MAC Address	The MAC address of the guest node.
IP Address	The IP address of the guest node.
IPv6 Address	The IPv6 address of the guest node.
Firmware Version	The version of the firmware operating on the guest node.
HTTP port	The HTTP port as specified with the http-enable command when defining a guest class. You can set this if the guest node provides an HTTP user interface on a non-standard port (any port other than port 80).

Related commands [atmf guest-class](#)
[switchport atmf-guestlink](#)
[show atmf backup guest](#)

show atmf links

Overview This command displays information about AMF links on a switch. The display output contains link status state information.

Syntax show atmf links [brief]

Parameter	Description
brief	A brief summary of AMF links, their configuration and status.

Mode User Exec and Privileged Exec

Usage notes The **show atmf links** and **show atmf links brief** commands both produce a table of summarized link information. For a more detailed view use the **show atmf links detail** command.

This command does not show links that are configured on provisioned ports.

Example To display a brief summary of the AMF links, use the following command:

```
node-1# show atmf links brief
```

Example output from show atmf links brief

Example-core# show atmf links						
ATMF Link Brief Information:						
Local Port	Link Type	Link Status	ATMF State	Adjacent Node	Adjacent Ifindex	Link State
1.0.10	Crosslink	Down	Init	*crosslink1	-	Blocking
1.0.14	Crosslink	Down	Init	*crosslink2	-	Blocking
1.0.1	Downlink	Down	Init	-	-	Blocking
1.0.2	Downlink	Up	Full	Node2	5001	Forwarding
1.0.8	Downlink	Up	Full	downlink1	5001	Forwarding
* = Provisioned.						

Parameter in the output from show atmf links brief

Parameter	Definition
Local Port	Shows the local port on the selected node.
Link Type	Shows link type as Uplink or Downlink (parent and child) or Cross-link (nodes in same domain).
Link Status	Shows the link status of the local port on the node as either Up or Down.
ATMF State	Shows AMF state of the local port: • Init - Link is down. • Hold - Link transitioned to up state, but waiting for hold period to ensure link is stable. • Incompatible - Neighbor rejected the link because of inconsistency in AMF configurations. • OneWay - Link is up and has waited the hold down period and now attempting to link to another unit in another domain. • OneWaySim - Device is running in secure mode and link is up but waiting for authorization from an AMF master. • Full - Link hello packets are sent and received from its neighbor with its own node id. • Shutdown - Link has been shut down by user configuration.
Adjacent Node	Shows the Adjacent AMF Node to the one being configured.
Adjacent IF Index	Shows the IF index for the Adjacent AMF Node connected to the node being configured.
Link State	Shows the state of the AMF link. Valid states are either Forwarding or Blocking.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#)**.

Related commands

- no debug all**
- clear atmf links statistics**
- show atmf**
- show atmf links detail**
- show atmf links guest**
- show atmf links guest detail**
- show atmf links statistics**
- show atmf nodes**

show atmf links detail

Overview This command displays detailed information on all the links configured in the AMF network. It can only be run on AMF master and controller nodes.

Syntax show atmf links detail

Parameter	Description
detail	Detailed AMF links information.

Mode User Exec

Usage notes For summarized link information see the [show atmf links](#) command.
This command does not show links that are configured on provisioned ports.

Example To display the AMF link details use this command:

```
device1# show atmf links detail
```

The output from this command will display all the internal data held for AMF links. The following example gives details of the links that are summarized in the example in [show atmf links](#).

Sample output from the show atmf links detail command

```
device1# show atmf links detail

-----
Crosslink Ports Information
-----
Port                : sa1
Ifindex             : 4501
Port Status         : Down
Port State          : Init
Last event          :
Port BPDU Receive Count : 0

Port                : po10
Ifindex             : 4610
Port Status         : Up
Port State          : Full
Last event          : AdjNodeLSEPresent
Port BPDU Receive Count : 140
Adjacent Node Name   : Building-B
Adjacent Ifindex     : 4610
Adjacent MAC         : eccd.6dd1.64d0
Port Last Message Response : 0

Port                : po30
Ifindex             : 4630
Port Status         : Up
Port State          : Full
Last event          : AdjNodeLSEPresent
Port BPDU Receive Count : 132
Adjacent Node Name   : Building-A
Adjacent Ifindex     : 4630
Adjacent MAC         : eccd.6daa.c861
Port Last Message Response : 0

Link State Entries:

Crosslink Ports Blocking : False
Node.Ifindex             : Building-A.4630 - Example-core.4630
Transaction ID           : 2 - 2
MAC Address              : eccd.6daa.c861 - 0000.cd37.054b
Link State               : Full - Full

Node.Ifindex             : Building-B.4610 - Example-core.4610
Transaction ID           : 2 - 2
MAC Address              : eccd.6dd1.64d0 - 0000.cd37.054b
Link State               : Full - Full

Domain Nodes Tree:

Node                    : Building-A
  Links on Node         : 1
  Link 0                : Building-A.4630 - Example-core.4630
  Forwarding State      : Forwarding
Node                    : Building-B
  Links on Node         : 1
  Link 0                : Building-B.4610 - Example-core.4610
  Forwarding State      : Forwarding
Node                    : Example-core
  Links on Node         : 2
```

```

Link 0                : Building-A.4630 - Example-core.4630
Forwarding State      : Forwarding
Link 1                : Building-B.4610 - Example-core.4610
Forwarding State      : Forwarding

Crosslink Transaction Entries:

Node                  : Building-B
Transaction ID        : 2
Uplink Transaction ID : 6
Node                  : Building-A
Transaction ID        : 2
Uplink Transaction ID : 6

Uplink Information:

Waiting for Sync      : 0
Transaction ID        : 6
Number of Links       : 0
Number of Local Uplinks : 0

Originating Node      : Building-A
Domain                 : -'s domain
Node                   : Building-A
Ifindex               : 0
Node Depth            : 0
Transaction ID        : 6
Flags                 : 32
Domain Controller     : -
Domain Controller MAC : 0000.0000.0000

Originating Node      : Building-B
Domain                 : -'s domain
Node                   : Building-B
Ifindex               : 0
Node Depth            : 0
Transaction ID        : 6
Flags                 : 32
Domain Controller     : -
Domain Controller MAC : 0000.0000.0000

Downlink Domain Information:

Domain                : Dept-A's domain
Domain Controller     : Dept-A
Domain Controller MAC : eccd.6d20.c1d9
Number of Links       : 2
Number of Links Up    : 2
Number of Links on This Node : 2
Links are Blocked     : 0
Node Transaction List
  Node                : Building-B
  Transaction ID      : 8
  Node                : Building-A
  Transaction ID      : 8

Domain List
  Domain              : Dept-A's domain
  Node                : Example-core
  Ifindex             : 4621
  Transaction ID      : 8
  Flags               : 1
  Domain              : Dept-A's domain
  Node                : Example-core
  Ifindex             : 4622
  Transaction ID      : 8
  Flags               : 1

Domain                : Dorm-D's domain
Domain Controller     : Dorm-D
Domain Controller MAC : 0000.cd37.082c
Number of Links       : 2

```

Number of Links Up	: 2
Number of Links on This Node	: 2
Links are Blocked	: 0
Node Transaction List	
Node	: Building-B
Transaction ID	: 20
Node	: Building-A
Transaction ID	: 20
Domain List	
Domain	: Dorm-D's domain
Node	: Building-A
Ifindex	: 0
Transaction ID	: 20
Flags	: 32
Domain	: Dorm-D's domain
Node	: Building-B
Ifindex	: 0
Transaction ID	: 20
Flags	: 32
Domain	: Dorm-D's domain
Node	: Example-core
Ifindex	: 4510
Transaction ID	: 20
Flags	: 1
Domain	: Dorm-D's domain
Node	: Example-core
Ifindex	: 4520
Transaction ID	: 20
Flags	: 1
Domain	: Example-edge's domain
Domain Controller	: Example-edge
Domain Controller MAC	: 001a.eb93.7aa6
Number of Links	: 1
Number of Links Up	: 1
Number of Links on This Node	: 0
Links are Blocked	: 0
Node Transaction List	
Node	: Building-B
Transaction ID	: 9
Node	: Building-A
Transaction ID	: 9
Domain List	
Domain	: Example-edge's domain
Node	: Building-A
Ifindex	: 0
Transaction ID	: 9
Flags	: 32
Domain	: Example-edge's domain
Node	: Building-B
Ifindex	: 5027
Transaction ID	: 9
Flags	: 1

Up/Downlink Ports Information	

Port	: sa10
Ifindex	: 4510
Port Status	: Up
Port State	: Full
Last event	: LinkComplete
Adjacent Node	: Dorm-A
Adjacent Internal ID	: 211
Adjacent Ifindex	: 4510
Adjacent Board ID	: 387
Adjacent MAC	: eccd.6ddf.6cdf
Adjacent Domain Controller	: Dorm-D

Adjacent Domain Controller MAC	: 0000.cd37.082c
Port Forwarding State	: Forwarding
Port BPDU Receive Count	: 95
Port Sequence Number	: 11
Port Adjacent Sequence Number	: 7
Port Last Message Response	: 0
Port	: po21
Ifindex	: 4621
Port Status	: Up
Port State	: Full
Last event	: LinkComplete
Adjacent Node	: Dept-A
Adjacent Internal ID	: 29
Adjacent Ifindex	: 4621
Adjacent Board ID	: 340
Adjacent MAC	: eccd.6d20.c1d9
Adjacent Domain Controller	: Dept-A
Adjacent Domain Controller MAC	: eccd.6d20.c1d9
Port Forwarding State	: Forwarding
Port BPDU Receive Count	: 96
Port Sequence Number	: 8
Port Adjacent Sequence Number	: 9
Port Last Message Response	: 0
Special Link Present	: FALSE

Parameter definitions from the show atmf links detail command output

Parameter	Definition
Crosslink Ports Information	Show details of all Crosslink ports on this Node: - Port - Name of the Port or static aggregation (sa<*>). - Ifindex - Interface index for the crosslink port. - VR ID - Virtual router id for the crosslink port. - Port Status - Status of the local port on the Node as UP or DOWN. - Port State - AMF State of the local port. - Init - Link is down. - Hold - Link transitioned to up state, but waiting for hold period to ensure link is stable. - Incompatible - Neighbor rejected the link because of inconsistency in AMF configurations. - OneWay - Link is up and has waited the hold down period and now attempting to link to another unit in another domain - Full - Link hello packets are sent and received from its neighbor with its own node id. - Shutdown - Link has been shut down by user configuration. Port BPDU Receive Count - The number of AMF protocol PDU's received. - Adjacent Node Name - The name of the adjacent node connected to this node. - Adjacent Ifindex - Adjacent AMF Node connected to this Node. - Adjacent VR ID - Virtual router id of the adjacent node in the domain. - Adjacent MAC - MAC address of the adjacent node in the domain. - Port Last Message Response - Response from the remote neighbor to our AMF last hello packet.

Parameter	Definition
Link State Entries	Shows all the link state database entries: • Node.Ifindex - Shows adjacent Node names and Interface index. • Transaction ID - Shows transaction id of the current crosslink transaction. • MAC Address - Shows adjacent Node MAC addresses. • Link State - Shows AMF states of adjacent nodes on the link.
Domain Nodes Tree	Shows all the nodes in the domain: • Node - Name of the node in the domain. • Links on Node - Number of crosslinks on a vertex/node. • Link no - Shows adjacent Node names and Interface index. • Forwarding State - Shows state of AMF link Forwarding/Blocking.
Crosslink Transaction Entries	Shows all the transaction entries: • Node - Name of the AMF node. • Transaction ID - transaction id of the node. • Uplink Transaction ID - transaction id of the remote node.
Uplink Information	Show all uplink entries. • Waiting for Sync - Flag if uplinks are currently waiting for synchronization. • Transaction ID - Shows transaction id of the local node. • Number of Links - Number of up downlinks in the domain. • Number of Local Uplinks - Number of uplinks on this node to the parent domain. • Originating Node - Node originating the uplink information. • Domain - Name of the parent uplink domain. • Node - Name of the node in the parent domain, that is connected to the current domain. • Ifindex - Interface index of the parent node's link to the current domain. • VR ID - Virtual router id of the parent node's link to the current domain. • Transaction ID - Transaction identifier for the neighbor in crosslink. • Flags - Used in domain messages to exchange the state: - ATMF_DOMAIN_FLAG_DOWN = 0 - ATMF_DOMAIN_FLAG_UP = 1 - ATMF_DOMAIN_FLAG_BLOCK = 2 - ATMF_DOMAIN_FLAG_NOT_PRESENT = 4 - ATMF_DOMAIN_FLAG_NO_NODE = 8 - ATMF_DOMAIN_FLAG_NOT_ACTIVE_PARENT = 16 - ATMF_DOMAIN_FLAG_NOT_LINKS = 32 - ATMF_DOMAIN_FLAG_NO_CONFIG = 64 • Domain Controller - Domain Controller in the uplink domain

Parameter	Definition
	Domain Controller MAC - MAC address of Domain Controller in uplink domain
Downlink Domain Information	Shows all the downlink entries: - Domain - Name of the downlink domain. - Domain Controller - Controller of the downlink domain. - Domain Controller MAC - MAC address of the domain controller. - Number of Links - Total number of links to this domain from the Node. - Number of Links Up - Total number of links that are in UP state. - Number of Links on This Node - Number of links terminating on this node. - Links are Blocked - 0 links are not blocked to the domain. 1 All links are blocked to the domain.
Node Transaction List	List of transactions from this downlink domain node. - Node - 0 links are not blocked to the domain. 1 All links are blocked to the domain. - Transaction ID - Transaction id for this node. - Domain List: Shows list of nodes in the current domain and their links to the downlink domain.: - Domain - Domain name of the downlink node. - Node - Name of the node in the current domain. - Ifindex - Interface index for the link from the node to the downlink domain. - Transaction ID - Transaction id of the node in the current domain. - Flags - As mentioned above.
Up/Downlink Ports Information	Shows all the configured up and down link ports on this node: - Port - Name of the local port. - Ifindex - Interface index of the local port. - VR ID - Virtual router id for the local port. - Port Status - Shows status of the local port on the Node as UP/DOWN. - Port State - AMF state of the local port. - Adjacent Node - nodename of the adjacent node. - Adjacent Internal ID - Unique node identifier of the remote node. - Adjacent Ifindex - Interface index for the port of adjacent AMF node. - Adjacent Board ID - Product identifier for the adjacent node. - Adjacent VR ID - Virtual router id for the port on adjacent AMF node. - Adjacent MAC - MAC address for the port on adjacent AMF node. - Adjacent Domain Controller - nodename of the Domain controller for Adjacent AMF node. - Adjacent Domain Controller MAC - MAC address of the Domain controller for Adjacent AMF node. - Port Forwarding State - Local port forwarding state Forwarding or Blocking. - Port BPDU Receive Count - count of AMF protocol PDU's received.

Parameter	Definition
	• Port Sequence Number - hello sequence number, incremented every time the data in the hello packet changes. • Port Adjacent Sequence Number - remote ends sequence number used to check if we need to process this packet or just note it arrived. • Port Last Message Response - response from the remote neighbor to our last hello packet.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Related commands **no debug all**
clear atmf links statistics
show atmf

show atmf links guest

Overview This command displays information about guest nodes visible to an AMF device.

Syntax show atmf links guest [interface <interface-range>]

Parameter	Description
interface <interface-range>	Select a specific range of ports to display information about guest nodes.

Default With no parameters specified this command will display its standard output for all ports with guest nodes connected.

Mode User Exec/Privileged Exec

Usage notes Use this command to display the guest nodes connected to a single parent node. If you want to see a list of all the guests in the AMF network, use [show atmf guests](#).

Example 1 To display information about AMF guests that are connectible from node1, use the command:

```
node1# show atmf links guest
```

Output The following shows typical output.

Example output from show atmf links guest

node1#sh atmf links guest					
Guest Link Information:					
DC = Discovery configuration					
S = static D = dynamic					
Local Port	Guest Class	Model Type	DC	MAC Address	IP / IPv6 Address
1.0.1	-	other	D	0013.1a1e.4589	192.168.1.2
1.0.2	aastra-phone	other	D	0008.5d10.7635	192.168.1.3
1.0.3	cisco-phone2	other	S	-	192.168.2.1
1.0.4	panasonic...	other	D	0800.239e.f1fe	192.168.1.5

Parameters in the output from show atmf links guest

Parameter	Description
Local Port	The port on the parent node that connects to the guest.
Guest Class	The name of the ATMF guest-class that has been assigned to the guest node by the atmf guest-class command.
Model Type	The model type of the guest node, as entered by the modeltype command. Can be one of the following: • alliedware • aw+ • tq • other
DC	The discovery method as applied by the discovery command. This can be either dynamic (D) or static (S).
MAC Address	The MAC address of the guest node.
IP / IPv6 Address	The IP address of the guest node.

Related commands

- atmf guest-class**
- discovery**
- http-enable**
- username (atmf-guest)**
- modeltype**
- switchport atmf-guestlink**
- show atmf backup guest**

show atmf links guest detail

Overview This command displays detailed information about guest nodes visible to an AMF device.

Syntax `show atmf links guest detail [interface <interface-range>]`

Parameter	Description
<code>interface <interface-range></code>	Select a specific range of ports to display information about guest nodes.

Mode User Exec and Privileged Exec

Usage notes Use this command to display the guest nodes connected to a single parent node. If you want to see a list of all the guests in the AMF network, use [show atmf guests detail](#).

Note that the parameters that are displayed depend on the guest node's model and state.

Example To display detailed information about AMF guests, use the command:
`node1# show atmf links guest detail`

Output The following shows typical output.

Example output from show atmf links guest detail

```
node1#show atmf links guest detail

Detailed Guest Link Information:

Interface                : port1.0.13
Link State                : Down
Class Name                : test
Model Type                : Other
Discovery Method          : Static
IP Address                : 192.168.1.13
Node State                : Down

Interface                : port1.0.5
Link State                : Full
Class Name                : tq_device
Model Type                : TQ
Discovery Method          : Dynamic
IP Address                : 192.168.1.221
Username                  : manager
Login Fallback            : Yes
Node State                : Full
Backup Supported          : Yes
MAC address               : 001a.ebab.d2e0
Device Type               : AT-TQ4600
Description               : AP221
Firmware Version          : 3.2.1 B02
HTTP port                 : 80
```

Parameters in the output from show atmf links guest detail

Parameter	Description
Interface	The port on the parent node that connects to the guest.
Link State	The state of the link to the guest node; one of: • Down: The physical link is down. • Up: The physical link has come up, but it is still during a timeout period that is enforced to allow other links to come up. • Learn: The timeout period described above has elapsed, and the link is now learning information from the AMF guest node. You can see what information it is learning from the "Node State" field below. • Full: The node connected by this link has joined the AMF network. • Fail: The port is physically up but something has prevented the guest node from joining the AMF network.
Class Name	The name of the ATMF guest-class that has been assigned to the guest node by the atmf guest-class command.

Parameter	Description
Model Type	The model type of the guest node, as entered by the modeltype command. The mode type can be one of the following: - alliedware - aw+ - onvif - tq - other
Discovery Method	The discovery method as applied by the discovery command. This can be either dynamic or static.
IP Address	The IP address of the guest node.
Username	The user name configured on the guest node.
Login Fallback	Whether the guest node supports Login Fallback. For TQ model guest nodes, when login fallback is enabled, if a guest node is replaced, then AMF logs in to the new TQ using the factory default manager/friend settings. The new TQ is then discovered and managed as an AMF guest node by an AMF master or member. This means any backed up settings for the replaced guest node can also be recovered.
Node state	The state of the guest node; one of: - Down: The initial state when a link to a guest node is first configured. This is also the state if the physical link goes down. - Getting IP: The AMF device is in the process of retrieving the IP address of the guest node. - Getting Mac: The AMF device is in the process of retrieving the MAC address of the guest node. - Getting Info: The AMF device is in the process of retrieving any other available information from the guest (firmware version etc). The information available depends on what device the guest node is. - Full: The AMF device has retrieved all necessary information and the guest node has joined the AMF network. Once this state is reached, the Link State also changes to "Full". - Failure: The physical link is up but the AMF member has failed to retrieve enough information to allow the guest node to join the AMF network.
Backup Supported	Whether the guest node supports AMF backup functionality.
MAC Address	The MAC address of the guest node.
Device Type	Model information for the guest node. This field shows the model information that AMF retrieved from the guest node. In contrast, the Model Type

Parameter	Description
	shows what a user entered as the type of device they intended this guest node to be.
Description	By default, this is a concatenation of the guest node's parent node and the port to which it is attached. You can change it by configuring a description on the port.
Serial Number	The serial number of the guest node.
Firmware Name	The name of the firmware operating on the guest node.
Firmware Version	The version of the firmware operating on the guest node.
HTTP port	The HTTP port as specified with the http-enable command when defining a guest class. You can set this if the guest node provides an HTTP user interface on a non-standard port (any port other than port 80).

Related commands

- [atmf guest-class](#)
- [discovery](#)
- [http-enable](#)
- [username \(atmf-guest\)](#)
- [modeltype](#)
- [switchport atmf-guestlink](#)
- [show atmf backup guest](#)

Command changes Version 5.5.0-1.1: **Login Fallback** parameter added

show atmf links statistics

Overview This command displays details of the AMF links configured on the device and also displays statistics about the AMF packet exchanges between the devices.

It is also possible to display the AMF link configuration and packet exchange statistics for a specified interface.

This command can only be run on AMF master and controller nodes

Syntax `show atmf links statistics [interface [<port-number>]]`

Parameter	Description
interface	Specifies that the command applies to a specific interface (port) or range of ports. Where both the interface and port number are unspecified, full statistics (not just those relating to ports) will be displayed.
<port-number>	Enter the port number for which statistics are required. A port range, a static channel or LACP link can also be specified. Where no port number is specified, statistics will be displayed for all ports on the device.

Mode User Exec

Example 1 To display AMF link statistics for the whole device, use the command:

```
device1# show atmf links statistics
```

Sample output from the show atmf links statistics command

ATMF Statistics:				
		Receive	Transmit	

Arealink Hello		318	327	
Crosslink Hello		164	167	
Crosslink Hello Domain		89	92	
Crosslink Hello Uplink		86	88	
Hello Link		0	0	
Hello Neighbor		628	630	
Hello Stack		0	0	
Hello Gateway		1257	1257	
Database Description		28	28	
Database Request		8	6	
Database Update		66	162	
Database Update Bitmap		0	29	
Database Acknowledge		144	51	
Transmit Fails		0	1	
Discards		0	0	
Total ATMF Packets		2788	2837	
ATMF Database Statistics:				
Database Entries		18		
Database Full Ages		0		
ATMF Virtual Link Statistics:				
Virtual link	Receive	Receive Dropped	Transmit	Transmit Dropped

vlink2000	393	0	417	0
ATMF Packet Discards:				
Type0	0	: Gateway hello msg received from unexpected neighbor		
Type1	0	: Stack hello msg received from unexpected neighbor		
Type2	0	: Discard TX update bitmap packet - bad checksum		
Type3	0	: Discard TX update packet - neighbor not in correct state		
Type4	0	: Discard update packet - bad checksum or type		
Type5	0	: Discard update packet - neighbor not in correct state		
Type6	0	: Discard update bitmap packet - bad checksum or type		
Type7	0	: Incarnation is not possible with the data received		
Type8	0	: Discard crosslink hello received - not correct state		
Type9	0	: Discard crosslink domain hello received on non crosslink		
Type10	0	: Discard crosslink domain hello - not in correct state		
Type11	0	: Crosslink uplink hello received on non crosslink port		
Type12	0	: Discard crosslink uplink hello - not in correct state		
Type13	0	: Wrong network-name for this ATMF		
Type14	0	: Packet received on port is too long		
Type15	0	: Bad protocol version, received on port		
Type16	0	: Bad packet checksum calculation		
Type17	0	: Bad authentication type		
Type18	0	: Bad simple password		
Type19	0	: Unsupported authentication type		
Type20	0	: Discard packet - unknown neighbor		
Type21	0	: Discard packet - port is shutdown		
Type22	0	: Non broadcast hello msg received from unexpected neighbor		
Type23	0	: Arealink hello msg received on non arealink port		
Type24	0	: Discard arealink hello packet - not in correct state		

```
Type25 0 : Discard arealink hello packet - failed basic processing
Type26 0 : Discard unicast packet - MAC address does not match node
Type27 0 : AMF Master license node limit exceeded
```

Example 2 To display the AMF links statistics on interface port1.0.4, use the command:

```
device1# show atmf links statistics interface port1.0.4
```

Sample output from the show atmf links statistics command for interface port1.0.4

```
device1# show atmf links statistics interface port1.0.4
```

ATMF Port Statistics:

		Transmit	Receive
port1.0.4	Crosslink Hello	231	232
port1.0.4	Crosslink Hello Domain	116	116
port1.0.4	Crosslink Hello Uplink	116	115
port1.0.4	Hello Link	0	0
port1.0.4	Arealink Hello	0	0

Parameter definitions from the show atmf links statistics command output

Parameter	Definition
Receive	Shows a count of AMF protocol packets received per message type.
Transmit	Shows the number of AMF protocol packets transmitted per message type.
Database Entries	Shows the number of AMF elements existing in the distributed database.
Database Full Ages	Shows the number of times the entries aged in the database.
ATMF Packet Discards	Shows the number of discarded packets of each type.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Related commands [no debug all](#)
[clear atmf links statistics](#)
[show atmf](#)

show atmf nodes

Overview This command displays nodes currently configured within the AMF network.

Note that the output also tells you whether or not node map exchange is active. Node map exchange improves the tracking of nodes joining and leaving an AMF network. This improves the efficiency of AMF networks. Node map exchange is only available if every node in your AMF network is running version 5.4.6-2.1 or later. We recommend running the latest version on all nodes in your network, so you receive the advantages of node map exchange and other improvements.

Syntax show atmf nodes [guest|all]

Parameter	Description
guest	Display only guest nodes in the AMF network.
	Display all nodes in the AMF network, including guest nodes.

Mode Privileged Exec

Usage notes You can use this command to display one of three sets of nodes:

- all nodes except guest nodes, by specifying **show atmf nodes**
- all nodes including guest nodes, by specifying **show atmf nodes all**
- only guest nodes, by specifying **show atmf nodes guest**

Examples To display AMF information for all nodes except guest nodes, use the command:

```
node1# show atmf nodes
```

Sample output from show atmf nodes

```
node1#show atmf nodes guest
Node Information:
  * = Local device
SC = Switch Configuration:
C = Chassis   S = Stackable   N = Standalone

Node Name      Device Type      ATMF Master  SC   Parent Domain      Node Depth
-----
* M1           x510-28GTX       Y            S    none               0
N3             x230-18GP        N            N    M1                 1
N1             AR4050S          N            N    M1                 1

Node map exchange is active
Current ATMF node count 3
```

To display AMF information for all nodes, including guest nodes, use the command:

```
node1# show atmf nodes all
```

Sample output from show atmf nodes all. In this example, not all nodes support node map exchange, as shown by the message at the end

```
node1#show atmf nodes all

Node and Guest Information:

* = Local device

SC = Switch Configuration:
C = Chassis   S = Stackable   N = Standalone G = Guest

Node/Guest      Device          ATMF      SC      Parent      Node
Name            Type            Master    SC      Domain      Depth
-----
* M1             x510-28GTX      Y         S       none        0
N3               x230-18GP       N         N       M1          1
N1               AR4050S         N         N       M1          1
N3-1.0.24        AT-TQ4600       N         G       N3          -

Node map exchange is inactive
Firmware on some nodes does not support node map exchange, eg AR4050S
Current ATMF node count 4 (guests 1)
```

To display AMF information for guest nodes only, use the command:

```
node1# show atmf nodes guest
```

Sample output from show atmf nodes guest

```
node1#show atmf nodes guest

Guest Information:
Device      MAC              Parent          Port          IP/IPv6
Name        Address          Address          Address
-----
aastra-...  0008.5d10.7635  Node-1          1.0.2         192.168.4.7
poe-1.0.1   0013.1a1e.4589  Node-1          1.0.1         192.168.4.6
ip-camera   0800.239e.f1fe  Node-1          1.0.4         192.168.4.8
tq4600      eccd.6df2.da60  Node-1          1.0.5         192.168.4.50
```

Related commands

- [show atmf](#)
- [show atmf area nodes](#)
- [discovery](#)
- [http-enable](#)
- [show atmf backup guest](#)

show atmf provision nodes

Overview This command displays information about each provisioned node with details about date and time of creation, boot and configuration files available in the backup, and license files present in the provisioned backup. This includes nodes that have joined the network but are yet to run their first backup.

This command can only be run on AMF master and controller nodes.

Syntax show atmf provision nodes

Mode Privileged Exec

Usage notes This command will only work if provisioned nodes have already been set up. Otherwise, an error message is shown when the command is run.

Example To show the details of all the provisioned nodes in the backup use the command:

```
NodeName# show atmf provision nodes
```

Sample output from the show atmf provision nodes command

```
device1#show atmf provision nodes

ATMF Provisioned Node Information:

Backup Media .....: SD (Total 3827.0MB, Free 3481.1MB)

Node Name           : device2
Date& Time          : 06-Oct-2016 & 23:25:44
Provision Path       : card:/atmf/provision_nodes

Boot configuration :
Current boot image  : x510-5.4.9-0.1.rel (file exists)
Backup boot image   : x510-5.4.8-2.3.rel (file exists)
Default boot config : flash:/default.cfg (file exists)
Current boot config : flash:/abc.cfg (file exists)
Backup boot config  : flash:/xyz.cfg (file exists)

Software Licenses :
Repository file    : ../configs/.sw_v2.lic
                  : ../configs/.swfeature.lic
Certificate file   : card:/atmf/nodes/awplus1/flash/.atmf-lic-cert
```

Related commands

- atmf provision (interface)**
- atmf provision node**
- clone (amf-provision)**
- configure boot config (amf-provision)**
- configure boot system (amf-provision)**
- create (amf-provision)**
- delete (amf-provision)**
- identity (amf-provision)**
- license-cert (amf-provision)**
- locate (amf-provision)**

show atmf recovery-file

Overview Use this command to display the recovery file information for an AMF node.

AMF recovery files are created for nodes with special links. Special links include:

- virtual links,
- area links terminating on an AMF master, and
- area virtual links terminating on an AMF master.

Syntax show atmf recovery-file

Mode Privileged Exec

Example To display recovery file information for an AMF node, use the command:

```
node1# show atmf recovery-file
```

Output The following shows typical output.

Example output from show atmf recovery-file

```
node1#show atmf recovery-file
ATMF Recovery File Info: Special Link Present
Location                Date       Time
USB storage device      30 Apr 2018 14:50:32
Master                  30 Apr 2018 14:56:45
node1                   30 Apr 2018 14:56:45
node3                   30 Apr 2018 14:56:45
```

Related commands [clear atmf recovery-file](#)
[show atmf backup](#)

Command changes Version 5.4.8-0.2: command added

show atmf secure-mode

Overview Use this command to display an overview of the secure mode status of an AMF network.

Syntax show atmf secure-mode

Mode Privileged Exec

Example To display an overview of AMF secure mode on an AMF master or member node, use the command:

```
awplus# show atmf secure-mode
```


Output The following shows typical output.

Example output from show atmf secure-mode on an AMF master

```
ATMF Secure Mode:

Secure Mode Status           : Enabled
Certificate Expiry           : 180 Days
Certificates Total           : 8
Certificates Revoked         : 0
Certificates Rejected        : 0
Certificates Active          : 8

Provisional Authorization    : 0
Pending Requests            : 0

Trusted Master               : master_1
Trusted Master               : master_2

Key Fingerprint:
 48:37:d9:a0:37:32:22:9b:5c:22:da:a2:62:49:a7:e5:a9:bc:12:88
```

Example output from show atmf secure-mode on an AMF node

```
ATMF Secure Mode:

Secure Mode Status           : Enabled
Trusted Master               : master_1
Trusted Master               : master_2

Key Fingerprint:
 93:f0:52:a9:74:8f:ae:ea:5b:e2:ee:62:cb:6b:21:22:5a:08:db:98
```

Parameters in the output from show atmf secure-mode

Parameter	Description
Secure Mode Status	Shows the status of secure mode, Enabled or Disabled.
Certificate Expiry	Certificate expiry time. Set with atmf secure-mode certificate expiry
Certificates Total	Total number of certificates.
Certificates Revoked	Certificates that have been revoked by the AMF master.
Certificates Rejected	Certificates that have been rejected by the AMF master.
Certificates Active	Certificates that are currently active.
Provisional Authorization	Number of nodes with provisional authorization. For more information use the show atmf authorization provisional command.
Pending Requests	Number of nodes waiting for authorization on the AMF master. For more information use the show atmf authorization pending command.
Trusted Master	List of trusted masters in the AMF area.

Parameter	Description
Key Fingerprint	The AMF node's key fingerprint.

Related commands

- [atmf authorize](#)
- [atmf secure-mode](#)
- [atmf secure-mode certificate expiry](#)
- [show atmf authorization](#)
- [show atmf secure-mode audit link](#)

Command changes Version 5.4.7-0.3: command added

show atmf secure-mode audit

Overview Use this command to detect security vulnerabilities on a node.

Syntax show atmf secure-mode audit

Mode Privileged Exec

Example To display AMF secure mode link audits for a node, use the command
awplus# show atmf secure-mode audit

Output The following shows typical output.

Example output from show atmf secure-mode audit

```
ATMF Secure Mode Audit:
Warning   : The default username and password is enabled.
Good      : SNMP V1 or V2 is disabled.
Warning   : Telnet server is enabled.
Good      : ATMF is enabled. Secure-Mode is on.
Good      : ATMF Topology-GUI is disabled. No trustpoints configured.

ATMF Secure Mode Log Events:
-----
2017 Feb 2 00:59:25 user.notice node1 ATMF[848]: Sec_Audit - ATMF Secure
Mode is enabled.
2017 Feb 2 01:30:00 user.notice node1 ATMF[848]: Sec_Audit - Established
secure connection to area_1_node_1 on interface vlink1.
```

Parameters in the output from show atmf secure-mode audit link

Parameter	Description
ATMF Secure Mode Audit	A list of security recommendations to secure the AMF network. Items prefaced with Warning need to be fixed. In the sample above the default username and password, and telnet, should be disabled.
ATMF Secure Mode Log Events	A list of recorded secure mode log events.

Related commands [show atmf secure-mode](#)

Command changes Version 5.4.7-0.3: command added

show atmf secure-mode audit link

Overview Use this command to detect security vulnerabilities by identifying devices that are connected to a secure mode node that are not in secure mode or are not authorized.

Syntax show atmf secure-mode audit link

Mode Privileged Exec

Example To display AMF secure mode link audits for a node, use the command
awplus# show atmf secure-mode audit link

Output The following shows typical output.

Example output from show atmf secure-mode audit link

ATMF Secure Mode Audit Link:			
* ATMF links connected to devices which are not authorized or are not in secure-mode.			
Port	Link Type	Discovered	Node/Area Name

vlink1	Downlink	16/02/2017 09:28:22	Member3

Parameters in the output from show atmf secure-mode audit link

Parameter	Description
Port	Port name on local device.
Link Type	Link type.
Discovered	Date discovered
Node/Area Name	Node or area name of remote device.

Related commands [show atmf](#)
[show atmf secure-mode](#)

Command changes Version 5.4.7-0.3: command added

show atmf secure-mode certificates

Overview Use this command to display the certificate status details when secure mode is enabled on an AMF network.

Syntax show atmf secure-mode certificates [detail] [area <area-name>]
[node <node-name>]

Parameter	Description
detail	Display detailed certificate information.
area	Specify an AMF area.
<area-name>	The AMF area you want to see the certificate information for.
node	Specify an AMF node.
<node-name>	The AMF node you want to see information for.

Mode Privileged Exec

Example To display AMF secure mode certificates on a master or member node, use the command:

```
awplus# show atmf secure-mode certificates
```

To display detailed information about AMF secure mode certificates for a node named "area_2_node_1" in an area named "area-2", use the command:

```
awplus# show atmf secure-mode certificates detail area area-2  
node area_2_node_1
```

Output The following shows typical output.

Example output from show atmf secure-mode certificates

Area-1 Certificates:			
Node Name	Signer	Expires	Status

area_1_node_1	master_1	11 Mar 2017	Active
	master_2	4 Mar 2017	
area_1_node_2	master_1	11 Mar 2017	Revoked
	master_2	4 Mar 2017	
Area-2 Certificates:			
Node Name	Signer	Expires	Status

area_2_node_1	master_1	18 Mar 2017	Active
area_2_node_2	master_1	18 Mar 2017	Rejected

Parameters in the output from show atmf secure-mode certificates

Parameter	Description
Node Name	Name of AMF node the certificate was issued to.
Signer	Name of AMF master that issued the certificate.
Expires	Certificate expiry date.
Status	The status column will display Active before a member node is trusted, and can be accessed using AMF commands. Valid statuses are Active, Revoked, and Rejected.

Output The following shows typical output.

**Example output from show atmf secure-mode certificates
detail area area-2 node area_2_node_1**

```
Certificates Detail:
-----
area_2_node_1 (area:area-2)
  MAC Address      : 0000.cd37.0003
  Status           : Active
  Serial Number    : A24SC8001
  Product          : x510-28GTX
  Key Fingerprint  : cd:b4:c9:cd:7b:87:6a:30:98:25:d7:3c:89:8e:cb:74:e8:91:56:9d
  Flags            : 00000011
  Signer           : master_1
  Expiry Date      : 18 Mar 2017 21:17:42
```

**Parameters in the output from show atmf secure-mode
certificates detail**

Parameter	Description
MAC Address	MAC address of AMF node.
Status	The device status will show Active if a member node is trusted, and can be accessed using AMF commands. Valid statuses are Active, Revoked, and Rejected.
Serial Number	Device serial number.
Product	Device product type.
Key Fingerprint	AMF node key fingerprint.
Flags	Internal AMF information.
Signer	Name of AMF master that issued the certificate.
Expiry Date	Certificate expiry date.

Related commands [atmf authorize](#)
[atmf secure-mode](#)
[atmf secure-mode certificate expire](#)
[atmf secure-mode certificate renew](#)
[clear atmf secure-mode certificates](#)
[show atmf secure-mode sa](#)

Command changes Version 5.4.7-0.3: command added

show atmf secure-mode sa

Overview Use this command to display the security associations on the network. This is the list of links and neighbors that are trusted.

Syntax `show atmf secure-mode sa [detail] [link|neighbor|broadcast]`

Parameter	Description
detail	Display detailed security association information.
link	Display security associations for type links.
neighbor	Display security associations for type neighbors.
broadcast	Display security associations for type broadcast.

Mode Privileged Exec

Example To display an overview of AMF secure mode security associations on a master or member node, use the command:

```
awplus# show atmf secure-mode sa
```

To display a detailed overview of AMF secure mode neighbor security associations on a master or member node, use the command:

```
awplus# show atmf secure-mode sa detail neighbor
```


Output The following shows typical output.

Example output from show atmf secure-mode sa

ATMF Security Associations:			
Type	State	ID	Details
Neighbor Node	Complete	175	master_1
Broadcast	Complete	4095	
CrossLink	Complete	4501	sa1
AreaLink	Cert Exchg	4511	sa11
Link	Complete	6009	port1.2.9
AreaLink	CA Exchg Init	6013	port1.2.13
AreaLink	Cert Exchg	13001	port1.9.1
Link	CA Exchg Init	16779521	vlink3
Neighbor Gateway	Complete	83	master_2
Neighbor Gateway	Complete	175	master_1
Neighbor Cntl-Master	Complete	83	master_2
Neighbor Cntl-Master	Complete	175	master_1

Example output from show atmf secure-mode sa detail neighbor

Security Associations Detail:	

Id	: 175 (af)
Type	: Neighbor Node
State	: Complete
Remote MAC Address	: eccd.6d82.6c16
Flags	: 000003c0
Id	: 83 (40000053)
Type	: Neighbor Gateway
State	: Complete
Remote MAC Address	: 001a.eb54.e53b
Flags	: 000003c0
Id	: 175 (400000af)
Type	: Neighbor Gateway
State	: Complete
Remote MAC Address	: eccd.6d82.6c16
Flags	: 000003c0
Id	: 83 (80000053)
Type	: Neighbor Cntl-Master
State	: Complete
Remote MAC Address	: 001a.eb54.e53b
Flags	: 000003c0
Id	: 175 (800000af)
Type	: Neighbor Cntl-Master
State	: Complete
Remote MAC Address	: eccd.6d82.6c16
Flags	: 000003c0
Id	: 321 (80000141)
Type	: Neighbor Cntl-Master
State	: Complete
Remote MAC Address	: 0000.f427.93da
Flags	: 000003c0

Parameters in the output from show atmf secure-mode sa

Parameter	Description
Type	Security Association (SA) types: • Link - SA for link • CrossLink - SA for crosslink • AreaLink - SA for area link • Neighbor Node - SA for node neighbor relationship • Neighbor Gateway - SA for gateway neighbor relationship • Neighbor Cntl-Master - SA for controller/master neighbor relationship • Broadcast - SA for working-set broadcast requests
State	Current state of the Security Association. The state must be Complete before a member node is trusted, and can be accessed using AMF commands. • CA Exchg Init - SA is ready to begin the SA exchange process • CA Exchg - SA is currently exchanging CAs • Cert Exchg - SA is currently exchanging certificates • Key Exchg - SA is currently exchanging ephemeral keys • Complete - SA exchange has completed
ID	Security Association ID. • For Neighbor types this is the remote node ID. • For Link types this is the local ifindex. • For Broadcast type this is always 4095.
Details	Human readable translation of ID. • For Neighbor types this is the node name • For Link types this is the interface name
Remote MAC Address	MAC address of the remote partner of the security association.
Flags	Internal AMF information.

Related commands [atmf secure-mode](#)
[show atmf secure-mode](#)
[show atmf secure-mode certificates](#)

Command changes Version 5.4.7-0.3: command added

show atmf secure-mode statistics

Overview Use this command to display AMF secure mode statistics. These statistics are from when AMF secure mode was first enabled or the statistics were cleared with the **clear atmf secure-mode statistics** command.

Syntax show atmf secure-mode statistics

Mode Privileged Exec

Example To display AMF secure mode statistics on a master or member node, use the command:

```
awplus# show atmf secure-mode statistics
```

Output The following shows typical output.

Example output from show atmf secure-mode statistics on an AMF master.

```
ATMF Secure Mode Statistics:

Certificates:
New ..... 7                Expired ..... 0
Updated ..... 7            Deleted ..... 0
Revoked ..... 1            Renewed ..... 2
Rejected ..... 1           Re-authorized .... 1
Authorized ..... 0

Local Certificates:
Valid ..... 4                Invalid ..... 0
Certificates Validation:
Request Valid ..... 2
Request Invalid ..... 0
Common Valid ..... 13
Common Invalid ..... 0
Issuer Valid ..... 14
Issuer Invalid ..... 0
Signature Verified ..... 29
Signature Invalid ..... 0
Signature Purpose Invalid ..... 0

Signatures Signed ..... 12
Master Certificates:
Re-issued ..... 3
Downgraded to member ..... 0

Public key change ..... 2
Invalid SA public key ..... 0
```

Output The following shows typical output.

Example output from show atmf secure-mode statistics on an AMF node.

```
ATMF Secure Mode Statistics:

Local Certificates:
Valid ..... 3                Invalid ..... 0

Certificates Validation:
Request Valid ..... 0
Request Invalid ..... 0
Common Valid ..... 0
Common Invalid ..... 0
Issuer Valid ..... 12
Issuer Invalid ..... 0
Signature Verified ..... 12
Signature Invalid ..... 3
Signature Purpose Invalid ..... 0

Signatures Signed ..... 0

Master Certificates:
Re-issued ..... 0
Downgraded to member ..... 0

Public key change ..... 2
Invalid SA public key ..... 0
```

Related commands [atmf authorize](#)
[atmf secure-mode](#)
[atmf secure-mode certificate renew](#)
[clear atmf secure-mode statistics](#)
[show atmf secure-mode](#)

Command changes Version 5.4.7-0.3: command added

show atmf tech

Overview This command collects and displays all the AMF command output. The command can thus be used to display a complete picture of an AMF network.

Syntax show atmf tech

Mode Privileged Exec

Example To display output for all AMF commands, use the command:

```
NodeName# show atmf tech
```

Sample output from the show atmf tech command.

```
node1#show atmf tech
ATMF Summary Information:

ATMF Status           : Enabled
Network Name          : ATMF_NET
Node Name              : node1
Role                   : Master
Current ATMF Nodes    : 8

ATMF Technical information:

Network Name           : ATMF_NET
Domain                 : node1's domain
Node Depth             : 0
Domain Flags           : 0
Authentication Type    : 0
MAC Address            : 0014.2299.137d

Board ID               : 287
Domain State           : DomainController
Domain Controller      : node1
Backup Domain Controller : node2
Domain controller MAC   : 0014.2299.137d
Parent Domain          : -
Parent Domain Controller : -
Parent Domain Controller MAC : 0000.0000.0000
Number of Domain Events : 0
Crosslink Ports Blocking : 0
Uplink Ports Waiting on Sync : 0

Crosslink Sequence Number : 7
Domains Sequence Number   : 28
Uplink Sequence Number    : 2
Number of Crosslink Ports : 1
Number of Domain Nodes    : 2
Number of Neighbors       : 5
Number of Non Broadcast Neighbors : 3
Number of Link State Entries : 1
Number of Up Uplinks      : 0
Number of Up Uplinks on This Node : 0
DBE Checksum              : 84fc6
Number of DBE Entries     : 0
...
```

Parameter definitions from the show atmf tech command

Parameter	Definition
ATMF Status	Shows status of AMF feature on the Node as Enabled/Disabled.
Network Name	The name of the AMF network to which this node belongs.
Node Name	The name assigned to the node within the AMF network.

Parameter	Definition
Role	The role configured on the device within the AMF - either master or member.
Current ATMF Nodes	A count of the AMF nodes in the AMF network.
Node Address	The identity of a node (in the format name.atmf) that enables its access it from a remote location.
Node ID	A unique identifier assigned to an AMF node.
Node Depth	The number of nodes in the path from this node to the core domain.
Domain State	A node's state within an AMF Domain - either controller or backup.
Recovery State	The AMF node recovery status. Indicates whether a node recovery is in progress on this device - either Auto, Manual, or None.
Management VLAN	The VLAN created for traffic between nodes of different domains (up/down links). VLAN ID - In this example VLAN 4092 is configured as the Management VLAN. Management Subnet - the Network prefix for the subnet. Management IP Address - the IP address allocated for this traffic. Management Mask - the Netmask used to create a subnet for this traffic 255.255.128.0 (= prefix /17)
Domain VLAN	The VLAN assigned for traffic between Nodes of same domain (crosslink). VLAN ID - In this example VLAN 4091 is configured as the domain VLAN. Domain Subnet - the Subnet address used for this traffic. Domain IP Address - the IP address allocated for this traffic. Domain Mask - the Netmask used to create a subnet for this traffic 255.255.128.0 (= prefix /17)
Device Type	Shows the Product Series Name.
ATMF Master	Indicates the node's membership of the core domain (membership is indicated by Y)
SC	Shows switch configuration: • C - Chassis (such as SBx8100 series) • S - Stackable (VCS)

Parameter	Definition
	• N - Standalone
Parent	A node that is connected to the present node's uplink, i.e. one layer higher in the hierarchy.
Node Depth	Shows the number of nodes in path from the current node to the Core domain.

NOTE: The command can produce very large output. For this reason only the most significant terms are defined in this table.

show atmf virtual-links

Overview This command displays a summary of all virtual links (L2TP tunnels) currently in the running configuration.

Syntax show atmf virtual-links [macaddr]
show atmf virtual-links [id <1-4094>] [remote-id <1-4094>]
show atmf virtual-links detail [id <1-4094>]

Parameter	Description
macaddr	Display the virtual AMF links' MAC addresses.
id <1-4094>	ID of the local virtual link.
remote-id <1-4094>	ID of the remote virtual link
detail	Display information about a specific virtual link ID or range of virtual link IDs. Displays information such as: local and remote IP address, link type, packets received and transmitted.

Mode Privileged Exec

Example 1 To display AMF virtual links, use the command:

```
node_1# show atmf virtual-links
```

Example output from show atmf virtual-links

ATMF Virtual-Link Information:						
Local Port	Local ID	Local IP	Remote ID	Remote IP	Tunnel Protect	Tunnel State
vlink1	1	172.16.24.2	2	1.0.0.2	-	Complete
vlink2	2	172.16.24.2*	10	172.16.24.3*	ipsec	Complete
vlink3	3	(eth0)*	1	1.2.3.4	-	AcquireLocal
* = Dynamic Address.						
Virtual Links Configured: 3						

In the above example, a centrally located switch has the IP address space 192.0.2.x/24. It has two VLANs assigned the subnets 192.0.2.33 and 192.0.2.65 using the prefix /27. Each subnet connects to a virtual link. The first link has the IP address 192.168.1.1 and has a Local ID of 1. The second has the IP address 192.168.2.1 and has the Local ID of 2.

Example 2 To display details about AMF virtual link with ID 1, use the command:

```
node_1# show atmf virtual-links detail id 1
```

Example output from show atmf virtual-links

Virtual Link Detailed Information:			
ID 1	Description	:	None
ID 1	Local IP Address	:	192.168.5.1
ID 1	Remote ID	:	1
ID 1	Remote IP Address	:	192.168.5.20
ID 1	Link Type	:	virtual-link
ID 1	Packets Received	:	236465
ID 1	Packets Transmitted	:	192626

Example 3 To display AMF virtual links' MAC address information, use the command:

```
node_1# show atmf virtual-links macaddr
```

Example output from show atmf virtual-links macaddr

ATMF Link Remote Information:			
ATMF Management Bridge Information:			
Bridge: br-atmfmgmt			
port no	mac addr	is local?	ageing timer
1	00:00:cd:27:c2:07	yes	0.00
2	8e:c7:ae:81:7e:68	yes	0.00
2	00:00:cd:28:bf:e7	no	0.01

Parameters in the output from show atmf virtual-links

Parameter	Definition
Local Port	The tunnel name e.g. vlink1, vlink2, equivalent to an L2TP tunnel.
Local ID	The local ID of the virtual link. This matches the vlink<number>
Tunnel Protect	Tunnel protection protocol.
Tunnel State	The operational state of the vlink (either Up or Down). This state is always displayed once a vlink has been created.
mac addr	AMF virtual links terminate on an internal soft bridge. The "show atmf virtual-links macaddress" command displays MAC Address information.
is local?	Indicates whether the MAC displayed is for a local or a remote device.
ageing timer	Indicates the current aging state for each MAC address.

Related commands [atmf virtual-link](#)

show atmf working-set

Overview This command displays the nodes that form the current AMF working-set.

Syntax show atmf working-set

Mode Privileged Exec

Example To show current members of the working-set, use the command:

```
ATMF_NETWORK[6]# show atmf working-set
```

Sample output from the show atmf working-set command.

```
ATMF Working Set Nodes:  
node1, node2, node3, node4, node5, node6  
Working set contains 6 nodes
```

Related commands

- [atmf working-set](#)
- [show atmf](#)
- [show atmf group](#)

show debugging atmf

Overview Use this command to see what debugging is turned on for AMF.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging atmf

Mode Privileged Exec

Example To display the AMF debugging status, use the command:

```
node_1# show debugging atmf
```

Sample output from the show debugging atmf command.

```
node_1# show debugging atmf
ATMF debugging status:
ATMF arealink debugging is on
ATMF link debugging is on
ATMF crosslink debugging is on
ATMF database debugging is on
ATMF neighbor debugging is on
ATMF packet debugging is on
ATMF error debugging is on
```

Related commands [debug atmf packet](#)

show debugging atmf packet

Overview Use this command to see what debugging is turned on for AMF Packet debug.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show debugging atmf packet

Mode User Exec and Privileged Exec

Example To display the AMF packet debugging status, use the command:

```
node_1# show debug atmf packet
```

Sample output from the show debugging atmf packet command.

```
ATMF packet debugging is on
=== ATMF Packet Debugging Parameters===
Node Name: x908
Port name: port1.1.1
Limit: 500 packets
Direction: TX
Info Level: Level 2
Packet Type Bitmap:
2. Crosslink Hello BPDU pkt with downlink domain info
3. Crosslink Hello BPDU pkt with uplink info
4. Down and up link Hello BPDU pkts
6. Stack hello unicast pkts
8. DBE request
9. DBE update
10. DBE bitmap update
```

Related commands [debug atmf](#)
[debug atmf packet](#)

show running-config atmf

Overview This command displays the running system information that is specific to AMF.

Syntax show running-config atmf

Mode User Exec and Global Configuration

Example To display the current configuration of AMF, use the following commands:

```
node_1# show running-config atmf
```

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Related commands [show running-config](#)
[no debug all](#)

state

Overview This command sets the running state of an AMF container on a Virtual AMF Appliance (VAA).

An AMF container is an isolated instance of AlliedWare Plus with its own network interfaces, configuration, and file system. The features available inside an AMF container are a sub-set of the features available on the host VAA. These features enable the AMF container to function as a uniquely identifiable AMF master and allows for multiple tenants (up to 60) to run on a single VAA host. See the [AMF Feature Overview and Configuration Guide](#) for more information on running multiple tenants on a single VAA host.

Syntax state {enable|disable}

Parameter	Description
disable	Stop the AMF container. The container's state changes to stopped.
enable	Start the AMF container. The container's state changes to running.

Default By default, **state** is disabled.

Mode AMF Container Configuration

Usage notes The first time the **state enable** command is executed on a container it assigns the container to an area and configures it as an AMF master. This is achieved by automatically adding the following configuration to the AMF container:

```
atmf network-name <AMF network-name>
atmf master
atmf area <container area-name> <container area-id> local
atmf area <container area-name> password <container area-password>
atmf area <host area-name> <host area-id>

interface eth0
  atmf-arealink remote-area <host area-name> vlan 4094
```

For this reason the **state enable** command should be run after the container has been created with the **atmf container** command and an area-link configured with the **area-link** command.

Once the start-up configuration has been saved from within the AMF container, all further configuration changes need to be made manually.

Example To start the AMF container “vac-wlg-1” use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# state enable
```

To stop the AMF container “vac-wlg-1” use the commands:

```
awplus# configure terminal
awplus(config)# atmf container vac-wlg-1
awplus(config-atmf-container)# state disable
```

Related commands **atmf container**
show atmf container

Command changes Version 5.4.7-0.1: command added

switchport atmf-agentlink

Overview Use this command to configure a link between this device and an x600 Series switch, in order to integrate the x600 Series switch into your AMF network. The x600 Series switch is called an “AMF agent”, and the link between the x600 and this device is called an “agent link”.

The x600 Series switch must be running version 5.4.2-3.16 or later.

Use the **no** variant of this command to remove the agent link. If the x600 Series switch is still connected to the switch port, it will no longer be part of the AMF network.

Syntax switchport atmf-agentlink
no switchport atmf-agentlink

Default By default, no agent links exist and x600 Series switches are not visible to AMF networks.

Mode Interface mode for a switch port. Note that the link between the x600 and the AMF network must be a single link, not an aggregated link.

Usage notes The x600 Series switch provides the following information to the AMF node that it is connected to:

- The MAC address
- The IPv4 address
- The IPv6 address
- The name/type of the device (Allied Telesis x600)
- The name of the current firmware
- The version of the current firmware
- The configuration name

AMF guestnode also makes most of this information available from x600 Series switches, but requires configuration with DHCP and/or LLDP.

AMF agent is simpler; as soon the x600 is connected to an appropriately configured port of an AMF node, it is immediately integrated into the AMF network.

To see information about the x600 Series switch, use the **show atmf links guest detail** command.

Example To configure port1.0.1 as an agent link, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# switchport atmf-agentlink
```

Related **show atmf links guest**
commands

switchport atmf-arealink

Overview This command enables you to configure a port or aggregator to be an AMF area link. AMF area links are designed to operate between two nodes in different areas in an AMF network.

Use the **no** variant of this command to remove any AMF area link that may exist for the selected port or aggregated link.

This command is only available on AMF controllers and master nodes.

Syntax `switchport atmf-arealink remote-area <area-name> vlan <2-4094>`
`no switchport atmf-arealink`

Parameter	Description
<area-name>	The name of the remote area that the port is connecting to.
<2-4094>	The VLAN ID for the link. This VLAN cannot be used for any other purpose, and the same VLAN ID must be used at each end of the link.

Default No arealinks are configured.

Mode Interface Configuration for a switchport, a static aggregator, or a dynamic channel group.

Usage notes Run this command on the port or aggregator at both ends of the link.

Each area must have the area-name configured, and the same area password must exist on both ends of the link.

Running this command will automatically place the port or static aggregator into trunk mode (i.e. `switchport mode trunk`) and will synchronize the area information stored on the two nodes.

You can configure multiple arealinks between two area nodes, but only one arealink at any time will be in use. All other arealinks will block information, to prevent network storms.

NOTE: See the command to configure an AMF area link on an AR-series Eth interface.

Example To make switchport port1.0.2 an arealink to the 'Auckland' area on VLAN 6, use the commands:

```
controller-1# configure terminal
controller-1(config)# interface port1.0.2
controller-1(config-if)# switchport atmf-arealink remote-area
Auckland vlan 6
```

To remove switchport port1.0.1 as an AMF area link, use the commands:

```
controller-1# configure terminal
controller-1(config)# interface port1.0.1
controller-1(config-if)# no switchport atmf-arealink
```

Related commands

- atmf area**
- atmf area password**
- atmf virtual-link**
- show atmf links**

switchport atmf-crosslink

Overview This command configures the selected port, statically aggregated link or dynamic channel group (LACP) to be an AMF crosslink. Running this command will automatically place the port or aggregator into trunk mode (i.e. **switchport mode trunk**).

The connection between two AMF masters must utilize a crosslink. Crosslinks are used to carry the AMF control information between master nodes. Multiple crosslinks can be configured between two master nodes, but only one crosslink can be active at any particular time. All other crosslinks between masters will be placed in the blocking state, in order to prevent broadcast storms.

Note that AlliedWare Plus CentreCOM Series switches are AMF Edge nodes and do not support virtual links or crosslinks. This is because each edge node can only have a single physical AMF link.

Use the **no** variant of this command to remove any crosslink that may exist for the selected port or aggregated link.

Syntax switchport atmf-crosslink
no switchport atmf-crosslink

Mode Interface Configuration for a switchport, a static aggregator or a dynamic channel group.

Usage notes Crosslinks can be used anywhere within an AMF network. They have the effect of separating the AMF network into separate domains.

Where this command is used, it is also good practice to use the **switchport trunk native vlan** command with the parameter **none** selected. This is to prevent a network storm on a topology of ring connected devices.

Example 1 To make switchport port1.0.1 an AMF crosslink, use the following commands:

```
Node_1# configure terminal
Node_1(config)# interface port1.0.1
Node_1(config-if)# switchport atmf-crosslink
```

Example 2 This example is shown twice. Example 2A is the most basic command sequence. Example 2B is a good practice equivalent that avoids problems such as broadcast storms that can otherwise occur.

Example 2A To make static aggregator sa1 an AMF crosslink, use the following commands:

```
Node_1# configure terminal
Node_1(config)# interface sa1
Node_1(config-if)# switchport atmf-crosslink
```

Example 2B To make static aggregator sa1 an AMF crosslink, use the following commands for good practice:

```
Node_1# configure terminal
Node_1(config)# interface sa1
Node_1(config-if)# switchport atmf-crosslink
Node_1(config-if)# switchport trunk allowed vlan add 2
Node_1(config-if)# switchport trunk native vlan none
```

In this example VLAN 2 is assigned to the static aggregator, and the native VLAN (VLAN 1) is explicitly excluded from the aggregated ports and the crosslink assigned to it.

NOTE: The AMF management and domain VLANs are automatically added to the aggregator and the crosslink.

Related commands [show atmf links statistics](#)

switchport atmf-guestlink

Overview

Guest links are used to provide basic AMF functionality to non AMF capable devices. Guest links can be configured for either a selected switch port or a range of switch ports and use generic protocols to collect status and configuration information that the guest devices make available.

Use the **no** variant of this command to remove the guest node functionality from the selected port or ports.

NOTE: AMF guest nodes are not supported on ports using the OpenFlow protocol.

Syntax switchport atmf-guestlink [class <guest-class>] [ip <A.B.C.D>|
ipv6 <X:X::X:X>]
no switchport atmf-guestlink

Parameter	Description
class	Set a guest class
<guest-class>	The name of the guest class.
ip	Specifies that the address following will have an IPv4 format
<A.B.C.D>	The guest node's IP address in IPv4 format.
ipv6	Specifies that the address following will have an IPv6 format
<X:X::X:X>	The guest node's IP address in IPv6 format.

Default No guest links are configured.

Mode Interface

Example 1 To configure switchport port1.0.1 to be a guest link, that will connect to a guest node having a guest class of **camera** and an IPv4 address of **192.168.3.3**, use the following commands:

```
node1# configure terminal
node1(config)# int port1.0.1
node1(config-if)# switchport atmf-guestlink class camera ip
192.168.3.3
```

Example 2 To configure switchport port1.0.1 to be a guest link, which will connect to a guest node having a guest class of **phone** and an IPv6 address of **2001:db8:21e:10d::5**, use the following commands:

```
node1# configure terminal
node1(config)# int port1.0.1
node1(config-if)# switchport atmf-guestlink class phone ipv6
2000:db8:21e:10d::5
```

Example 3 To configure switchport port1.0.1 to be a guest link, using the default model type and learning method address, use the following commands:

```
node1# configure terminal
node1(config)# int port1.0.1
node1(config-if)# switchport atmf-guestlink
```

Example 4 To configure switchports port1.0.1 to port1.0.3 to be guest links, for the guest class **camera**, use the following commands:

```
node1# configure terminal
node1(config)# int port1.0.1-port1.0.3
node1(config-if)# switchport atmf-guestlink class camera
```

Example 5 To remove the guest-link functionality from switchport port1.0.1, use the following commands:

```
node1# configure terminal
node1(config)# int port1.0.1
node1(config-if)# no switchport atmf-guestlink
```

Related commands

- atmf guest-class**
- discovery**
- http-enable**
- username (atmf-guest)**
- modeltype**
- show atmf links guest**
- show atmf guests**

switchport atmf-link

Overview This command enables you to configure a port or aggregator to be an up/down AMF link. Running this command will automatically place the port or aggregator into trunk mode. If the port was previously configured in access mode, the configured access VLAN will be removed.

Use the **no** variant of this command to remove any AMF link that may exist for the selected port or aggregated link.

Syntax switchport atmf-link
no switchport atmf-link

Mode Interface Configuration for a switchport, a static aggregator or a dynamic channel group.

Usage notes Up/down links and virtual links interconnect domains in a vertical hierarchy, with the highest domain being the core domain. In effect, they form a tree of interconnected AMF domains. This tree must be loop-free. Therefore you must configure your up/down and virtual links so that no loops are formed.

Within each domain, cross-links between AMF nodes define those nodes as siblings within the same domain. You can form rings by combining cross-links with up/down links and/or virtual links, as long as each AMF domain links upwards to only a single parent domain. Each domain may link downwards to multiple child domains.

NOTE: See the command to configure an AMF up/down link on an AR-series Eth interface.

Example To configure switchport port1.0.1 as an AMF up/down link, use the commands:

```
Node_1# configure terminal
Node_1(config)# interface port1.0.1
Node_1(config-if)# switchport atmf-link
```

To remove switchport port1.0.1 as an AMF up/down link, use the commands:

```
Node_1# configure terminal
Node_1(config)# interface port1.0.1
Node_1(config-if)# no switchport atmf-link
```

Related commands [atmf-link](#)
[show atmf detail](#)
[show atmf links](#)

type atmf guest

Overview This command configures a trigger to activate when an AMF guest node joins or leaves.

Syntax type atmf guest {join|leave}

Parameter	Description
join	AMF guest node joins.
leave	AMF guest node leaves.

Mode Trigger Configuration

Example To configure trigger 86 to activate when an AMF guest node leaves, use the following commands:

```
awplus(config)# trigger 86
awplus(config-trigger)# type atmf guest leave
```

Related commands [show trigger](#)

Command changes Version 5.5.1-1.1: command added

type atmf node

Overview This command configures a trigger to activate when an AMF node joins or leaves.

Syntax type atmf node {join|leave}

Parameter	Description
join	AMF node joins.
leave	AMF node leaves.

Mode Trigger Configuration

Example 1 To configure trigger 5 to activate when an AMF node leaves, use the following commands. In this example the command is entered on node-1:

```
node1(config)# trigger 5
node1(config-trigger)# type atmf node leave
```

Example 2 The following commands will configure trigger 5 to activate if an AMF node join event occurs on any node within the working set:

```
node1# atmf working-set group all
```

This command returns the following display:

```
=====
node1, node2, node3:
=====

Working set join
```

Note that the running the above command changes the prompt from the name of the local node, to the name of the AMF-Network followed, in square brackets, by the number of member nodes in the working set.

```
AMF-Net[3]# conf t
AMF-Net[3](config)# trigger 5
AMF-Net[3](config-trigger)# type atmf node leave
AMF-Net[3](config-trigger)# description "E-mail on AMF Exit"
AMF-Net[3](config-trigger)# active
```

Enter the name of the script to run at the trigger event.

```
AMF-Net[3](config-trigger)# script 1 email_me.scp
AMF-Net[3](config-trigger)# end
```

Display the trigger configurations

```
AMF-Net[3]# show trigger
```

This command returns the following display:

```
=====
node1:
=====

TR# Type & Details      Description      Ac Te Tr Repeat      #Scr Days/Date
-----
001 Periodic (2 min)    Periodic Status Chk Y  N  Y Continuous    1  smtwtfS
005 ATMF node (leave)  E-mail on ATMF Exit Y  N  Y Continuous    1  smtwtfS
-----

=====
Node2, Node3,
=====

TR# Type & Details      Description      Ac Te Tr Repeat      #Scr Days/Date
-----
005 ATMF node (leave)  E-mail on ATMF Exit Y  N  Y Continuous    1  smtwtfS
-----
```

Display the triggers configured on each of the nodes in the AMF Network.

```
AMF-Net[3]# show running-config trigger
```

This command returns the following display:

```
=====
Node1:
```

```
=====

trigger 1
  type periodic 2
  script 1 atmf.scp
trigger 5
  type atmf node leave
description "E-mail on ATMF Exit"
  script 1 email_me.scp
!

=====
Node2, Node3:
=====

trigger 5
  type atmf node leave
description "E-mail on ATMF Exit"
  script 1 email_me.scp
!
```

Related [show trigger](#)
commands

undebbug atmf

Overview This command is an alias for the **no** variant of the **debug atmf**.

username (atmf-guest)

Overview This command enables you to assign a **username** to a guest class. Guests may require a username and possibly also a password. The password must be between 1 and 32 characters and will allow spaces.

Syntax username <name> password [8] <userpass>
no username

Parameter	Description
<name>	User name of the guest node.
8	The parameter 8 means that the password that follows is in hashed form, not plain text. Do not type this 8 when creating a password with this command; it is only used in configuration files. In configuration files, the device prints 8 in front of passwords, to indicate that it is displaying the password in its hashed form.
<userpass>	The password to be entered for the guest node.

Default No usernames are configured

Mode AMF Guest Configuration

Example To assign the user name 'reception' and the password of 'secret' to an AMF guest node that has the guest class of 'phone1' use the following commands:

```
node1# configure terminal
node1(config)# amf guest-class phone1
node1(config-atmf-guest)# username reception password secret
```

To remove a guest node username and password for the user guest class 'phone1', use the following commands:

```
node1# configure terminal
node1(config)# atmf guest-class phone1
node1(config-atmf-guest)# no username
```

Related commands

- [show atmf links detail](#)
- [atmf guest-class](#)
- [switchport atmf-guestlink](#)
- [show atmf links guest](#)
- [show atmf nodes](#)

55

STOAT Commands

- Contents**
- **Introduction** on page 3021
 - **clear stoat collector session counters** on page 3022
 - **description (stoat-dest)** on page 3023
 - **key (stoat-dest)** on page 3024
 - **name-check (stoat-dest)** on page 3025
 - **service stoat** on page 3026
 - **show stoat collector** on page 3027
 - **show stoat destinations** on page 3030
 - **shutdown (stoat-dest)** on page 3032
 - **stoat collector enable** on page 3033
 - **stoat collector expiry-period** on page 3034
 - **stoat collector key** on page 3035
 - **stoat collector trustpoint** on page 3037
 - **stoat destination** on page 3038
 - **stoat discovery** on page 3040
 - **trustpoint (stoat-dest)** on page 3042
 - **unique-id** on page 3043

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure Device Discovery using STOAT (Standardized Topology Organizer and Transport).

Using LLDP and DHCP Snooping, STOAT can discover and gather information about devices in the local network. These devices may include IP cameras, IP phones, PCs, laptops, Wi-fi access points, printers, and so on.

Vista Manager EX merges the data from STOAT and existing discovery methods such as AMF, and AMF Plus Device Discovery, to provide a single, accurate and more complete view of the network.

For more information, see the [Device Discovery using STOAT Feature Overview and Configuration Guide](#).

clear stoat collector session counters

Overview Use this command to clear the STOAT transport session counters.

Syntax clear stoat collector session counters [<1-4294967295>]

Parameter	Description
<1-4294967295>	Session ID

Mode Privileged Exec

Example To clear all STOAT transport session counters, use the command:

```
awplus# clear stoat collector session counters
```

To clear a specific STOAT transport session counter, use the command:

```
awplus# clear stoat collector session counters 234234234
```

Related commands

- [stoat collector trustpoint](#)
- [show stoat collector](#)
- [stoat collector expiry-period](#)
- [stoat collector key](#)

Command changes Version 5.5.3-1.1: command added

description (stoat-dest)

Overview Use this command to add an informative description to a STOAT destination.

Use the **no** variant of this command to remove a description from a STOAT destination.

Syntax `description <description>`
`no description`

Parameter	Description
<code><description></code>	A word or phrase that uniquely identifies this STOAT destination or its purpose. Valid characters are any printable character and spaces, up to a maximum of 40 characters.

Default Not set.

Mode STOAT Destination Configuration

Example To add the description 'chc-collector-1' to a STOAT destination with IP address 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# description chc-collector-1
```

To remove the description from a STOAT destination with IP address 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# no description
```

Related commands [stoat destination](#)

Command changes Version 5.5.3-1.1: command added

key (stoat-dest)

Overview Use this command to configure a key to use with a STOAT destination. The key allows the STOAT collector to authenticate this device as a valid source. The destination will not attempt to connect if no key is set.

A matching key must be configured on the STOAT collector device.

Use the **no** variant of this command to remove a key for a STOAT destination.

Syntax key [8] <key-string>
no key

Parameter	Description
8	Specifies that you are entering a password as a string that has already been encrypted instead of entering a plain text password. The running config displays the new password as an encrypted string even if password encryption is turned off.
<key-string>	Shared key string applied, a value in the range 8 to 80 characters.

Default Not set.

Mode STOAT Destination Configuration

Example To configure the key 'verysecret' for STOAT destination 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# key verysecret
```

To remove the key for STOAT destination 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# no key
```

Related commands [stoat collector key](#)
[stoat destination](#)

Command changes Version 5.5.3-1.1: command added

name-check (stoat-dest)

Overview Use this command to enable or disable certificate name checking for the server certificate received from the STOAT collector.

Use the **no** variant of this command to disable name checking for the server certificate received from the STOAT collector.

Syntax name-check
no name-check

Default Disabled.

Mode STOAT Destination Configuration

Usage notes If enabled, the received server certificate must contain the address configured for this STOAT destination . This setting only takes effect if the STOAT destination has been configured with a trustpoint.

Example To enable name-check for STOAT destination 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-destination)# name-check
```

To disable name-check for STOAT destination 192.0.2.6, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-destination)# no name-check
```

Related commands [service stoat](#)

Command changes Version 5.5.3-1.1: command added

service stoat

Overview Use this command to enable or disable Standardized Topology Organizer and Transport (STOAT) functionality on a device. Once enabled, the device will accept STOAT collector and STOAT source configuration.

Use the **no** variant of this command to disable STOAT functionality on a device.

Syntax service stoat
no service stoat

Default Disabled.

Mode Global Configuration

Example To enable STOAT functionality on a device, use the commands:

```
awplus# configure terminal  
awplus(config)# service stoat
```

To disable STOAT functionality on a device, use the commands:

```
awplus# configure terminal  
awplus(config)# no service stoat
```

Related commands [stoat collector trustpoint](#)
[stoat collector expiry-period](#)
[stoat collector key](#)
[show stoat collector](#)

Command changes Version 5.5.3-1.1: command added

show stoat collector

Overview Use this command to see the operational status of the STOAT collector.

Syntax show stoat collector [sessions|keys]

Parameter	Description
sessions	Active session information
keys	Authentication key information

Mode Privileged Exec

Example To show the STOAT collector status information, use the command:

```
awplus# show stoat collector
```

To show the STOAT collector active session information, use the command:

```
awplus# show stoat collector sessions
```

To show the STOAT collector authentication key information, use the command:

```
awplus# show stoat collector keys
```

Output **Example output from show stoat collector**

```
awplus#show stoat collector
STOAT Collector Information:
-----
Status      : Enabled
Expiry-period : 60 seconds
Trustpoint   : default-selfsigned
```

Example output from show stoat collector sessions

```
awplus#show stoat collector sessions
STOAT Collector Session Information:
-----
Sessions created           : 2
Sessions expired           : 0
Sessions failed            : 0
Sessions failed sync authentication : 0
Sessions failed update     : 0
Sessions failed update authentication : 0

Session ID                 : 3F4B5C27
Source Name                : alice
State                     : Active
Counters
  Update success           : 0
  Update authentication failure : 0
  Update failure           : 0
  RX payload bytes         : 11
  RX payload apteryx set failure : 0
  RX payload json parse failure : 0
  RX payload json decode failure : 0

Session ID                 : 23DFBD7B
Source Name                : bob
State                     : Active
Counters
  Update success           : 0
  Update authentication failure : 0
  Update failure           : 0
  RX payload bytes         : 0
  RX payload apteryx set failure : 0
  RX payload json parse failure : 0
  RX payload json decode failure : 1
```

Example output from show stoat collector keys

```
awplus#show stoat collector keys
STOAT Collector Key Information:
-----
Key                                Description                                Last Used Time
                                   (H:M:S ago)
-----
CoA4E6riSbdWzzetHhHM5F5WdBFPXX2DH6jNzZmYtns= "generated key"                00:12:52
secret-key                                "super secret key"              -
```

Related commands **service stoat**
 stoat collector expiry-period
 stoat collector enable

Command changes Version 5.5.3-1.1: command added

show stoat destinations

Overview Use this command to see the operational status of the configured STOAT destinations.

Syntax show stoat destinations [detail]

Parameter	Description
detail	Show detailed information

Mode Privileged Exec

Example To show summary information about STOAT destinations, use the command:

```
awplus# show stoat destinations
```

To show detailed information about STOAT destinations, use the command:

```
awplus# show stoat destinations detail
```

Output The following shows typical output.

Example output from show stoat destinations

```
awplus#show stoat destinations
STOAT Destination Summary Information:
-----|
Address      : 192.168.0.12
State        : Hold

Address      : 192.168.0.2
State        : Active
```

Example output from show stoat destinations detail

```
awplus#show stoat destinations detail
STOAT Destination Summary Information:
-----|
Address      : 192.168.0.12
State        : Hold
Session ID   : 0
Expiry-period : 0 seconds
Counters:
  Sync OK           : 0
  Sync failed - unreachable : 6612
  Sync failed - authentication : 0
  Sync failed - bad response  : 0
  Update OK         : 0
  Update failed - unreachable : 0
  Update failed - authentication : 0
  Update failed - unknown session : 0
  RX bytes          : 0
  TX bytes          : 0
Address      : 192.168.0.2
State        : Active
Session ID   : 200558F4
Expiry-period : 60 seconds
Counters:
  Sync OK           : 139
  Sync failed - unreachable : 10
  Sync failed - authentication : 0
  Sync failed - bad response  : 0
  Update OK         : 32773
  Update failed - unreachable : 52
  Update failed - authentication : 0
  Update failed - unknown session : 81
  RX bytes          : 4099
  TX bytes          : 16787801
```

Related commands [stoat destination shutdown \(stoat-dest\)](#)

Command changes Version 5.5.3-1.1: command added

shutdown (stoat-dest)

Overview Use this command to disable a STOAT destination.
Use the **no** variant of this command to enable a STOAT destination.

Syntax shutdown
no shutdown

Default Enabled (no shutdown)

Mode STOAT Destination Configuration

Example To enable the STOAT destination 192.0.2.6, use the commands:
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# no shutdown

Related commands [stoat destination](#)
[show stoat destinations](#)

Command changes Version 5.5.3-1.1: command added

stoat collector enable

Overview Use this command to start or stop the Standardized Topology Organizer and Transport (STOAT) collector functionality on a device.

Note: The device must be able to receive requests from STOAT sources before this command is used. To enable a device to receive requests from STOAT, use the [service stoat](#) command.

Use the **no** variant of this command to stop the STOAT collector functionality on a device.

Syntax stoat collector enable
no stoat collector enable

Default Disabled.

Mode Global Configuration

Usage notes The STOAT feature is responsible for discovering devices and network topology, organizing that information into a standardized format, and transporting it to a central location for use. AMF uses STOAT data to allow non-AMF devices and their links to be displayed in the AMF topology map.

There are two types of STOAT device:

- **Collector** - receives and aggregates topology data
- **Source** - sends data to a collector. The data contains information that it knows about itself and has learned through discovery protocols

Example To start the STOAT collector, use the commands:

```
awplus# configure terminal  
awplus(config)# stoat collector enable
```

To stop the STOAT collector, use the commands:

```
awplus# configure terminal  
awplus(config)# no stoat collector enable
```

Related commands [stoat collector trustpoint](#)
[show stoat collector](#)
[stoat collector expiry-period](#)
[stoat collector key](#)

Command changes Version 5.5.3-1.1: command added.

stoat collector expiry-period

Overview Use this command to modify the session expiry-period for all of the STOAT collector's sessions.

Use the **no** variant of this command to revert to the default expiry-period of 60 seconds.

Syntax stoat collector expiry-period <10-300>
no stoat collector expiry-period

Parameter	Description
<10-300>	Expiry-period in seconds (default: 60)

Default 60 seconds.

Mode Global Configuration

Example To configure an expiry-period of 15 seconds, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# stoat collector expiry-period 15
```

To revert the expiry-period to its default of 60 seconds, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no stoat collector expiry-period
```

Related commands

- [service stoat](#)
- [stoat collector trustpoint](#)
- [stoat collector key](#)
- [stoat collector enable](#)
- [show stoat collector](#)

Command changes Version 5.5.3-1.1: command added

stoat collector key

Overview Use this command to configure the authentication key used by the STOAT collector.

Use the **no** variant of this command to remove a STOAT authentication key.

Syntax `stoat collector key [8]{auth-key|generate} [description <description>]`
`no stoat collector key [8]{auth-key|generate} [description <description>]`

Parameter	Description
8	Specifies a key in encrypted format instead of plain text.
auth-key	Authentication key
generate	Let STOAT generate a key
description	Add a useful description
<description>	The useful description text

Default Not set.

Mode Global Configuration

Example To configure a plain-text key 'secret-key' with no description, use the commands:

```
awplus# configure terminal
awplus(config)# stoat collector key secret-key
```

To configure a plain-text key 'secret-key' with a description, use the commands:

```
awplus# configure terminal
awplus(config)# stoat collector key secret-key description 'this
is my secret key'
```

To **generate** a key with a description, use the commands:

```
awplus# configure terminal
awplus(config)# stoat collector key generate description 'my
generated key'
```

To configure an encrypted key with a description, use the commands:

```
awplus# configure terminal
awplus(config)# stoat collector key 8
CFWzNguaqyoPDqYoCBGzff07CfQZ0J-eJ00JslX0N3E= description 'my
encrypted key'
```

To remove a configured encrypted key, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat collector key 8
CFWzNguaqyoPDqYoCBGzff07CfQZ0J-eJ00JslX0N3E=
```

Output The following shows typical output.

Example output from stoat collector key generate

```
awplus(config)# stoat collector key generate
NttWCIS0KsyQ1-1_98qi4HcVdMRykeaE8IKfPe1Xv9o
```

Related commands

- [service stoat](#)
- [stoat collector trustpoint](#)
- [stoat collector expiry-period](#)
- [stoat collector enable](#)
- [show stoat collector](#)

Command changes Version 5.5.3-1.1: command added

stoat collector trustpoint

Overview Use this command to add a crypto PKI trustpoint containing a server certificate and a key to the STOAT collector. This enables secure HTTPS API communication between the STOAT collector and STOAT source.

Use the **no** variant of this command to remove a configured PKI trustpoint from a STOAT collector.

Syntax stoat collector trustpoint <trustpoint-name>
no stoat collector trustpoint

Parameter	Description
<trustpoint-name>	PKI trustpoint name.

Mode Global Configuration

Example To add an existing PKI trustpoint called 'chc' to the STOAT collector, use the commands:

```
awplus# configure terminal
awplus(config)# stoat collector trustpoint chc
```

To remove a configured PKI trustpoint from the STOAT collector, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat collector trustpoint
```

Related commands [crypto pki authenticate](#)
[crypto pki enroll](#)
[crypto pki trustpoint](#)

Command changes Version 5.5.3-1.1: command added

stoat destination

Overview Use this command to configure a remote STOAT collector destination.

Use the **no** variant of this command to remove a STOAT collector destination.

Syntax `stoat destination {<ip-address>|<host-name>|<ipv6-address>}`
`no stoat destination {<ip-address>|<host-name>|<ipv6-address>}`

Parameter	Description
<code><ip-address></code>	The IPv4 address, using the format A.B.C.D.
<code><host-name></code>	The host name specified in FQDN (Fully Qualified Domain Name). For example, manager.your.domain.com.
<code><ip6-address></code>	The IPv6 address, using the format X:X::X:X.

Default Not set.

Mode Global Configuration

Example To configure a remote STOAT collector at IP address 10.0.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 10.0.0.1
```

To remove a remote STOAT collector at IP address 10.0.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat destination 10.0.0.1
```

To configure a remote STOAT collector at stoat.com, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination stoat.com
```

To remove a remote STOAT collector at stoat.com, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat destination stoat.com
```

To configure a remote STOAT collector at 2001:db8::1, use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 2001:db8::1
```

To remove a remote STOAT collector at 2001:db8::1, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat destination 2001:db8::1
```

Related commands [stoat collector key](#)
[show stoat collector](#)
[stoat discovery](#)

Command changes Version 5.5.3-1.1: command added

stoat discovery

Overview Use this command to enable a device to import Standardized Topology Organizer and Transport (STOAT) discovery information learned by a given protocol. This command allows the device to act as a STOAT collector. STOAT collectors receive and aggregate topology data used in the AMF topology map.

Use the **no** variant of this command to disable the import of STOAT discovery information learned by a given protocol.

Syntax stoat discovery dhcp-snooping
stoat discovery dot1x
stoat discovery lldp
no stoat discovery dhcp-snooping
no stoat discovery dot1x
no stoat discovery lldp

Parameter	Description
dhcp-snooping	Import information learned through the DHCP Snooping protocol.
lldp	Import information learned through the LLDP protocol.
dot1x	Import information learned through 802.1X and Port authentication

Default Disabled.

Mode Global Configuration

Example To enable a device to import information learned by the DHCP Snooping protocol, use the commands:

```
awplus# configure terminal
awplus(config)# stoat discovery dhcp-snooping
```

To disable a device from importing information learned by the DHCP Snooping protocol, use the commands:

```
awplus# configure terminal
awplus(config)# no stoat discovery dhcp-snooping
```

Related commands [ip dhcp snooping](#)
[lldp run](#)
[stoat destination](#)

Command Version 5.5.3-1.1: command added
changes Version 5.5.3-2.1: **dot1x** and **wireless** parameters added

trustpoint (stoat-dest)

Overview Use this command to specify the trustpoint to use when authenticating the STOAT collector. If no trustpoint is specified, the STOAT collector will be implicitly trusted without authentication.

Use the **no** variant of this command to stop the use of trustpoints with a specified STOAT destination.

Syntax trustpoint <trustpoint-name>
no trustpoint

Parameter	Description
<trustpoint-name>	Name of the trustpoint.

Default Not set.

Mode STOAT Destination Configuration

Example To configure the STOAT destination 192.0.2.6 to use trustpoint 'chc', use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# trustpoint chc
```

To stop the use of trustpoints with STOAT destination 192.0.2.6 use the commands:

```
awplus# configure terminal
awplus(config)# stoat destination 192.0.2.6
awplus(config-stoat-dest)# no trustpoint
```

Related commands [stoat collector trustpoint](#)
[stoat destination](#)
[name-check \(stoat-dest\)](#)

Command changes Version 5.5.3-1.1: command added

unique-id

Overview Use this command to generate a new unique ID for a device. This ID is used to uniquely identify a device in the STOAT topology.

Some circumstances may require you to generate a new unique ID, for example after recovering a device from an AMF provisioned backup.

Syntax unique-id

Mode Privileged Exec

Example To generate a new unique ID for a STOAT device, use the command:

```
awplus# unique-id
```

Related commands [service stoat](#)

Command changes Version 5.5.3-1.1: command added

56

Management Stacking Commands

- Contents**
- **Introduction** on page 3045
 - **mstack command-node** on page 3046
 - **mstack enable** on page 3047
 - **mstack remote-login** on page 3048
 - **show mstack nodes** on page 3050
 - **switchport mstack-link** on page 3051

Introduction

Overview This chapter provides an alphabetical reference of commands used to configure management stacking.

For introductory information about management stacking in AlliedWare Plus, including overview and configuration information, see the **[Management Stacking Feature Overview and Configuration Guide](#)**.

mstack command-node

Overview This command configures the device as an management stacking command node. This is considered the core of the management stack.

From the command node, you can use the remote-login command to access and configure other nodes in the management stack.

Syntax mstack command-node
no mstack command-node

Mode Global Config

Usage notes A management stacking command node has to be present for a management stack to form. Only one device in the management stack can be the command node.

Example To make the device called command-node into the management stacking command node, use the commands:

```
command-node#configure terminal
command-node(config)#mstack command-node
```

To disable the device from being the management stacking command node, use the commands:

```
command-node# configure terminal
command-node(config)#no mstack command-node
```

mstack enable

Overview This command manually enables (turns on) the management stacking feature for the switch being configured.

Use the no variant of this command to disable (turn off) the management stacking feature on the node.

Syntax mstack enable
no mstack enable

Mode Global Configuration

Usage notes To use management stacking you need to enable management stacking on each switch in the management stack.

Examples To turn on the management stacking feature:

```
MyNode# config terminal  
MyNode(config)# mstack enable
```

To turn off the management stacking feature:

```
MyNode(config)# no mstack enable
```

mstack remote-login

Overview Use this command to remotely log in from the command node to another management stacking node. This lets you run commands as if you were a local user of that node.

Syntax `mstack remote-login [user <name>] <nodename>`

Parameter	Description
<name>	User name.
<nodename>	The host name of the node.

Mode Privileged Exec (This command will only run at privilege level 15)

Usage notes You do not need a valid login on the local device in order to run this command. The session will take you to the enable prompt on the new device. If the remote login session exits for any reason (e.g. device reboot) you will be returned to the originating node.

The software will not allow you to run multiple remote login sessions. You must exit an existing session before starting a new one.

In the remote login command, the hostname is not case sensitive. For example, the following commands all let you log into a host named node-02:

```
command-node# mstack remote-login node-02
command-node# mstack remote-login Node-02
command-node# mstack remote-login NODE-02
```

Example 1 To remotely login from command-node to node20, use the following command:

```
command-node# mstack remote-login node20
```

The following information is displayed:

```
Type 'exit' to return to command-node.
AlliedWare Plus (TM) 0.0.0 01/07/15 20:00:58
node20>
```

You can then enter commands on node20:

```
node20> enable
node20# <other-commands>
```

To close the remote login session, use the following command:

```
node20# exit
```

Example 2 In this example, user whitney is a valid user of command-node and node3. She can remotely login from command-node to node3 by using the following commands:

```
command-node# mstack remote-login user whitney node3  
node3>
```

show mstack nodes

Overview This command displays all nodes currently configured within the management stacking network.

Syntax show mstack nodes

Mode Privileged Exec

Example To display management stacking information for all nodes in the management stack, use the command:

```
awplus# show mstack nodes
```

Output The following shows typical output.

Sample output from the show mstack nodes command.

Node Information:						
* = Local device						
SC = Switch Configuration:						
C = Chassis S = Stackable N = Standalone						
Node	Device	MSTACK				
Node Name	Type	C-Node	SC	Parent	Depth	

* x320_1	AT-x320GH/10	Y	N	none	0	
x320_2	AT-x320GH/10	N	N	x320_1	1	
x320_3	AT-x320GH/10	N	N	x320_2	2	
Node map exchange is active						
Current MSTACK node count 3						

switchport mstack-link

Overview This command enables you to configure a link to be a management stack link.

Use the no variant of this command to remove any mstack-link that may exist for the selected link.

Syntax switchport mstack-link
no switchport mstack-link

Mode Interface Configuration

Usage notes Running this command will automatically place the port or aggregator into trunk mode. The link can be a link between switch ports or aggregated ports.

Example To make a switchport into a management stack link, use the following commands:

```
command-node# configure terminal
command-node(config)# interface port1.0.1
command-node(config-if)# switchport mstack-link
```

57

Dynamic Host Configuration Protocol (DHCP) Commands

- Contents**
- **Introduction** on page 3054
 - **bootfile** on page 3055
 - **clear ip dhcp binding** on page 3056
 - **default-router** on page 3057
 - **dns-server** on page 3058
 - **domain-name** on page 3060
 - **host (DHCP)** on page 3061
 - **host client-id** on page 3062
 - **ip address dhcp** on page 3064
 - **ip dhcp bootp ignore** on page 3066
 - **ip dhcp globally-authoritative** on page 3067
 - **ip dhcp leasequery enable** on page 3068
 - **ip dhcp option** on page 3069
 - **ip dhcp pool** on page 3072
 - **ip dhcp-client default-route distance** on page 3073
 - **ip dhcp-client request vendor-identifying-specific** on page 3075
 - **ip dhcp-client vendor-identifying-class** on page 3076
 - **ip dhcp-relay agent-option** on page 3077
 - **ip dhcp-relay agent-option checking** on page 3079
 - **ip dhcp-relay agent-option remote-id** on page 3080
 - **ip dhcp-relay agent-option subscriber-id** on page 3082
 - **ip dhcp-relay information policy** on page 3084
 - **ip dhcp-relay maxhops** on page 3086
 - **ip dhcp-relay max-message-length** on page 3087
 - **ip dhcp-relay server-address** on page 3089
 - **ip dhcp-relay short-lease** on page 3091
 - **ip dhcp-relay use-client-side-address** on page 3092
 - **ip dhcp-relay use-dhcp-relay-ip** on page 3094
 - **ip dhcp use-subscriber-id** on page 3095
 - **lease** on page 3097
 - **network (DHCP)** on page 3099
 - **next-server** on page 3100
 - **option** on page 3101
 - **probe enable** on page 3103
 - **probe packets** on page 3104
 - **probe timeout** on page 3105

- **probe type** on page 3106
- **range** on page 3107
- **route** on page 3108
- **service dhcp-relay** on page 3109
- **service dhcp-server** on page 3110
- **short-lease-threshold** on page 3111
- **show counter dhcp-client** on page 3113
- **show counter dhcp-relay** on page 3115
- **show counter dhcp-server** on page 3119
- **show dhcp lease** on page 3121
- **show ip dhcp binding** on page 3122
- **show ip dhcp pool** on page 3124
- **show ip dhcp-relay** on page 3128
- **show ip dhcp server statistics** on page 3129
- **show ip dhcp server summary** on page 3132
- **subnet-mask** on page 3133
- **use-subscriber-id** on page 3134

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure DHCP.

For more information, see the **DHCP Feature Overview and Configuration Guide**.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

bootfile

Overview This command sets the boot filename for a DHCP server pool. This is the name of the boot file that the client should use in its bootstrap process. It may need to include a path.

The **no** variant of this command removes the boot filename from a DHCP server pool.

Syntax bootfile <filename>
no bootfile

Parameter	Description
<filename>	The boot file name.

Mode DHCP Configuration

Example To configure the boot filename for a pool P2, use the command:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# bootfile boot/main_boot.bt
```

clear ip dhcp binding

Overview This command clears either a specific lease binding or the lease bindings specified by the command or DHCP server. The command will only take effect on dynamically allocated bindings, not statically configured bindings.

Syntax `clear ip dhcp binding {ip <ip-address>|mac <mac-address>|all|pool <pool-name>|range <low-ip-address> <high-ip-address>}`

Parameter	Description
<code>ip <ip-address></code>	IPv4 address of the DHCP client, in dotted decimal notation in the format A.B.C.D.
<code>mac <mac-address></code>	MAC address of the DHCP client, in hexadecimal notation in the format HHHH.HHHH.HHHH.
<code>all</code>	All DHCP bindings.
<code>pool <pool-name></code>	Description used to identify DHCP server address pool. Valid characters are any printable character. If the name contains spaces then you must enclose these in "quotation marks".
<code>range <low-ip-address> <high-ip-address></code>	IPv4 address range for DHCP clients, in dotted decimal notation. The first IP address is the low end of the range, the second IP address is the high end of the range.

Mode User Exec and Privileged Exec

Usage A specific binding may be deleted by **ip** address or **mac** address, or several bindings may be deleted at once using **all**, **pool** or **range**.

Note that if you specify to clear the **ip** or **mac** address of what is actually a static DHCP binding, an error message is displayed. If **all**, **pool** or **range** are specified and one or more static DHCP bindings exist within those addresses, any dynamic entries within those addresses are cleared but any static entries are not cleared.

Examples To clear the specific IP address binding 192.168.1.1, use the command:

```
awplus# clear ip dhcp binding ip 192.168.1.1
```

To clear all dynamic DHCP entries, use the command:

```
awplus# clear ip dhcp binding all
```

Related commands [show ip dhcp binding](#)

default-router

Overview This command adds a default router to the DHCP address pool you are configuring. You can use this command multiple times to create a list of default routers on the client's subnet. This sets the router details using the pre-defined option 3. Note that if you add a user-defined option 3 using the **option** command, then you will override any settings created with this command.

The **no** variant of this command removes either the specified default router, or all default routers from the DHCP pool.

Syntax default-router *<ip-address>*
no default-router [*<ip-address>*]

Parameter	Description
<i><ip-address></i>	IPv4 address of the default router, in dotted decimal notation.

Mode DHCP Configuration

Examples To add a router with an IP address 192.168.1.2 to the DHCP pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# default-router 192.168.1.2
```

To remove a router with an IP address 192.168.1.2 to the DHCP pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no default-router 192.168.1.2
```

To remove all routers from the DHCP pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no default-router
```

dns-server

Overview This command adds a Domain Name System (DNS) server to the DHCP address pool you are configuring. You can use this command multiple times to create a list of DNS name servers available to the client. This sets the DNS server details using the pre-defined option 6.

Note that if you add a user-defined option 6 using the **option**, then you will override any settings created with this command.

The **no** variant of this command removes either the specified DNS server, or all DNS servers from the DHCP pool.

Syntax `dns-server <ip-address>`
`no dns-server [<ip-address>]`

Parameter	Description
<code><ip-address></code>	IPv4 address of the DNS server, in dotted decimal notation.

Mode DHCP Configuration

Examples To add the DNS server with the assigned IP address 192.168.1.1 to the DHCP pool named P1, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# dns-server 192.168.1.1
```

To remove the DNS server with the assigned IP address 192.168.1.1 from the DHCP pool named P1, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no dns-server 192.168.1.1
```

To remove all DNS servers from the DHCP pool named P1, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no dns-server
```

Related commands

- default-router**
- option**
- service dhcp-server**
- show ip dhcp pool**
- subnet-mask**

domain-name

Overview This command adds a domain name to the DHCP address pool you are configuring. Use this command to specify the domain name that a client should use when resolving host names using the Domain Name System. This sets the domain name details using the pre-defined option 15.

Note that if you add a user-defined option 15 using the **option**, then you will override any settings created with this command.

The **no** variant of this command removes the domain name from the address pool.

Syntax domain-name <domain-name>
no domain-name

Parameter	Description
<domain-name>	The domain name you wish to assign the DHCP pool. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".

Mode DHCP Configuration

Examples To add the domain name Nerv_Office to DHCP pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# domain-name Nerv_Office
```

To remove the domain name Nerv_Office from DHCP pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no domain-name Nerv_Office
```

Related commands

- default-router**
- dns-server**
- option**
- service dhcp-server**
- show ip dhcp pool**
- subnet-mask**

host (DHCP)

Overview This command adds a static host address to the DHCP address pool you are configuring. The client with the matching MAC address is permanently assigned this IP address. No other clients can request it.

The **no** variant of this command removes the specified host address from the DHCP pool. Use the **no host all** command to remove all static host addresses from the DHCP pool.

Syntax `host <ip-address> <mac-address>`
`no host <ip-address>`
`no host all`

Parameter	Description
<code><ip-address></code>	IPv4 address of the DHCP client, in dotted decimal notation in the format A.B.C.D
<code><mac-address></code>	MAC address of the DHCP client, in hexadecimal notation in the format HHHH.HHHH.HHHH

Mode DHCP Configuration

Usage Note that a network/mask must be configured using a **network** command before issuing a **host** command. Also note that a host address must match a network to add a static host address.

Examples To add the host at 192.168.1.5 with the MAC address 000a.451d.6e34 to DHCP pool 1, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool 1
awplus(dhcp-config)# network 192.168.1.0/24
awplus(dhcp-config)# host 192.168.1.5 000a.451d.6e34
```

To remove the host at 192.168.1.5 with the MAC address 000a.451d.6e34 from DHCP pool 1, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool 1
awplus(dhcp-config)# no host 192.168.1.5 000a.451d.6e34
```

Related Commands [lease range](#)
[show ip dhcp pool](#)

host client-id

Overview Use this command to add a static host address reservation to the DHCP address pool you are configuring for the DHCP client with the given client identifier.

Use the **no** variant of this command to remove the specified host address reservation from the DHCP pool. Use the **no host all** command to remove all static host addresses from the DHCP pool.

Syntax `host <ip-address> client-id <client-identifier>`
`no host <ip-address>`

Parameter	Description
<code><ip-address></code>	IPv4 address of the DHCP client, in dotted decimal notation in the format A.B.C.D
<code><client-identifier></code>	An alphanumeric string to be used as a client identifier. This is from 1 to 63 characters in length. This string can also contain special characters '#', '-', '_' and '.'.

Default No host static IP address reservations are defined for a pool.

Mode DHCP Configuration

Usage notes The client with the matching client-id is permanently assigned this IP address. No other clients can request it. If a subscriber identifier for a client identifier substitution is enabled for a remote pool, the DHCP server will expect to see the subscriber identifier sub-option being included in the relay agent information option on the relay client packet. And the subscriber-id is matched against the static host reservation with the matching client identifier.

A network/mask must be configured using the **network** command before issuing a host command. Also note that a host address must match a network to add a static host address.

Example To add a static host address for client-id 'office-pc-21' to a pool, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool Campus-1
awplus(dhcp-config)# host 192.168.2.5 client-id office-pc-21
```

Output The following shows typical output.

Example output from show ip dhcp binding

```
awplus#show ip dhcp binding Campus-1

Pool Campus-1 Network 192.168.2.0/24
DHCP Client Entries
IP Address      ClientId                                     Type      Expiry
-----
192.168.2.5     office-pc-21                                   Static    Infinite

awplus#show ip dhcp pool Campus-1
Pool Campus-1 :
  subscriber-id substitution for client-id is enabled
  network: 192.168.2.0/24
  address ranges:
    addr: 192.168.2.50 to 192.168.2.100
  static host addresses:
    addr: 192.168.2.5      Client-id: office-pc-21
  lease <1:0:0:0>
  subnet mask: 255.255.255.0 (pool's network mask)
  dns servers: 192.168.2.2
  default-router(s): 192.168.2.2
  Probe:
    Status:      Enabled      Default Values [Enabled]
    Type:        Ping         [Ping]
    Packets:     5             [5]
    Timeout:     200 msecs    [200]
  Dynamic addresses:
    Total:       51
    Leased:      0
    Utilization: 0.0 %
  Static host addresses:
    Total:       1
    Leased:      1
```

Related commands [network \(DHCP\)](#)

Command changes Version 5.5.2-0.1: command added

ip address dhcp

Overview This command activates the DHCP client on the interface you are configuring. This allows the interface to use the DHCP client to obtain its IP configuration details from a DHCP server on its connected network.

The **client-id** and **hostname** parameters are identifiers that you may want to set in order to interoperate with your existing DHCP infrastructure. If neither option is needed, then the DHCP server uses the MAC address field of the request to identify the host.

The DHCP client supports the following IP configuration options:

- Option 1— the subnet mask for your device.
- Option 3— a list of default routers.
- Option 6 — a list of DNS servers. This list appends the DNS servers set on your device with the **ip name-server** command.
- Option 15—a domain name used to resolve host names. This option replaces the domain name set with the **ip domain-name** command. Your device ignores this domain name if it has a domain list set using the **ip domain-list** command.
- Option 51—lease expiration time.

The **no** variant of this command stops the interface from obtaining IP configuration details from a DHCP server.

Syntax `ip address dhcp [client-id <interface>] [hostname <hostname>]`
`no ip address dhcp`

Parameter	Description
<code>client-id</code> <code><interface></code>	The name of the interface you are activating the DHCP client on. If you specify this, then the MAC address associated with the specified interface is sent to the DHCP server in the optional identifier field. Default: no default
<code>hostname</code> <code><hostname></code>	The hostname for the DHCP client on this interface. Typically this name is provided by the ISP. Default: no default

Mode Interface Configuration for VLAN interfaces.

Examples To set the interface vlan2 to use DHCP to obtain an IP address, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip address dhcp
```

To stop the interface vlan2 from using DHCP to obtain its IP address, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip address dhcp
```

Related commands **ip address (IP Addressing and Protocol)**
show ip interface
show running-config

ip dhcp bootp ignore

Overview This command configures the DHCP server to ignore any BOOTP requests it receives. The DHCP server accepts BOOTP requests by default.

The **no** variant of this command configures the DHCP server to accept BOOTP requests. This is the default setting.

Syntax ip dhcp bootp ignore
no ip dhcp bootp ignore

Mode Global Configuration

Examples To configure the DHCP server to ignore BOOTP requests, use the commands:

```
awplus# configure terminal  
awplus(config)# ip dhcp bootp ignore
```

To configure the DHCP server to respond to BOOTP requests, use the commands:

```
awplus# configure terminal  
awplus(config)# no ip dhcp bootp ignore
```

Related commands [show ip dhcp server summary](#)

ip dhcp globally-authoritative

Overview Use this command to make the DHCP server globally authoritative. When the DHCP server is globally authoritative, it responds to all DHCP requests and inform messages, even if it has no DHCP pool for the request's subnet. If the server doesn't have an applicable DHCP pool, it can't assign an IP address, so it immediately responds with a NACK message.

Use the **no** variant of this command to stop the server from being globally authoritative. If you do that, the server will not respond to the above messages. This means the client will need to time out if it has sent one of the above messages, as it will not receive a reply.

Note that the server will:

- always be authoritative for DHCP requests and inform messages if it has a DHCP pool for the relevant subnet
- never be globally authoritative if the server is also configured as a relay agent, even if this command is enabled. In that case, it will only reply if the server has a DHCP pool for the relevant subnet. Otherwise, the server could respond to a message that was intended for the other server at the end of the relay agent.

Syntax `ip dhcp globally-authoritative`
`no ip dhcp globally-authoritative`

Default Enabled

Mode Global Configuration

Example To stop the server from being globally authoritative, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp globally-authoritative
```

Related commands [show ip dhcp server summary](#)

Command changes Version 5.5.5-1.1: command added

ip dhcp leasequery enable

Overview Use this command to enable the DHCP server to respond to DHCPLEASEQUERY packets. Enabling the DHCP leasequery feature allows a DHCP Relay Agent to obtain IP address information directly from the DHCP server using DHCPLEASEQUERY messages.

Use the **no** variant of this command to disable the support of DHCPLEASEQUERY packets.

For more information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax ip dhcp leasequery enable
no ip dhcp leasequery enable

Default DHCP leasequery support is disabled by default.

Mode Global Configuration

Examples To enable DHCP leasequery support, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp leasequery enable
```

To disable DHCP leasequery support, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp leasequery enable
```

Related commands [show counter dhcp-server](#)
[show ip dhcp server statistics](#)
[show ip dhcp server summary](#)

ip dhcp option

Overview This command creates a user-defined DHCP option. Options with the same number as one of the pre-defined options override the standard option definition. The pre-defined options use the option numbers 1, 3, 6, 15, and 51.

You can use this option when configuring a DHCP pool, by using the **option** command.

The **no** variant of this command removes either the specified user-defined option, or removes all user-defined options. This also automatically removes the user-defined options from the associated DHCP address pools.

Syntax `ip dhcp option <1-254> [name <option-name>] [<option-type>]`
`no ip dhcp option [<1-254>|<option-name>]`

Parameter	Description										
<1-254>	The option number of the option. Options with the same number as one of the standard options overrides the standard option definition.										
<option-name>	Option name used to identify the option. You cannot use a number as the option name. Valid characters are any printable character. If the name contains spaces then you must enclose it in “quotation marks”. Default: no default										
<option-type>	The option value. You must specify a value that is appropriate to the option type: <table><tr><td>ascii</td><td>An ASCII text string</td></tr><tr><td>hex</td><td>A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long.</td></tr><tr><td>ip</td><td>An IPv4 address or mask that has the dotted decimal A.B.C.D notation. To create a list of IP addresses, you must add each IP address individually by using the option command multiple times.</td></tr><tr><td>integer</td><td>A number from 0 to 4294967295.</td></tr><tr><td>flag</td><td>A value that either sets (to 1) or unsets (to 0) a flag: true, on, or enabled will set the flag. false, off or disabled will unset the flag.</td></tr></table>	ascii	An ASCII text string	hex	A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long.	ip	An IPv4 address or mask that has the dotted decimal A.B.C.D notation. To create a list of IP addresses, you must add each IP address individually by using the option command multiple times.	integer	A number from 0 to 4294967295.	flag	A value that either sets (to 1) or unsets (to 0) a flag: true, on, or enabled will set the flag. false, off or disabled will unset the flag.
ascii	An ASCII text string										
hex	A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long.										
ip	An IPv4 address or mask that has the dotted decimal A.B.C.D notation. To create a list of IP addresses, you must add each IP address individually by using the option command multiple times.										
integer	A number from 0 to 4294967295.										
flag	A value that either sets (to 1) or unsets (to 0) a flag: true, on, or enabled will set the flag. false, off or disabled will unset the flag.										

Mode Global Configuration

Examples To define a user-defined ASCII string option as option 66, without a name, use the command:

```
awplus# configure terminal
awplus(config)# ip dhcp option 66 ascii
```

To define a user-defined hexadecimal string option as option 46, with the name tcpip-node-type, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp option 46 name tcpip-node-type hex
```

To define a user-defined IP address option as option 175, with the name special-address, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp option 175 name special-address ip
```

To remove the specific user-defined option with the option number 12, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp option 12
```

To remove the specific user-defined option with the option name perform-router-discovery, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp option perform-router-discovery
```

To remove all user-defined option definitions, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp option
```

Related commands

- [default-router](#)
- [dns-server](#)
- [domain-name](#)
- [option](#)
- [service dhcp-server](#)
- [show ip dhcp server summary](#)
- [subnet-mask](#)

ip dhcp pool

Overview This command will enter the configuration mode for the pool name specified. If the name specified is not associated with an existing pool, the device will create a new pool with this name, then enter the configuration mode for the new pool.

Once you have entered the DHCP configuration mode, all commands executed before the next **exit** command will apply to this pool.

You can create multiple DHCP pools on devices with multiple interfaces. This allows the device to act as a DHCP server on multiple interfaces to distribute different information to clients on the different networks.

The **no** variant of this command deletes the specific DHCP pool.

Syntax `ip dhcp pool <pool-name>`
`no ip dhcp pool <pool-name>`

Parameter	Description
<pool-name>	Description used to identify this DHCP pool. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".

Mode Global Configuration

Example To create the DHCP pool named P2 and enter DHCP Configuration mode, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)#
```

To delete the DHCP pool named P2, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp pool P2
```

Related commands [service dhcp-server](#)

ip dhcp-client default-route distance

Overview Use this command to specify an alternative Administrative Distance (AD) for the current default route (from DHCP) for an interface.

Use the **no** variant of this command to set the AD back to the default of 1.

Syntax ip dhcp-client default-route distance [<1-255>]
no ip dhcp-client default-route distance

Parameter	Description
<1-255>	Administrative Distance (AD) from the range 1 though 255.

Default 1

Mode Interface Configuration for VLAN interfaces.

Usage notes DHCP client interfaces can automatically add a default route with an AD of 1 into the IP Routing Information Base (RIB).

Any pre-existing default route(s) via alternative interfaces (configured with a higher AD) will no longer be selected as the preferred forwarding path for traffic when the DHCP based default route is added to the IP routing table.

This can be problematic if the DHCP client is operating via an interface that is only intended to be used for back-up interface redundancy purposes, such as an interface with lower bandwidth or a particular role like the management interface.

Use this command to set the AD of the default route (via a specific DHCP client interface) to a non-default (higher cost) value, ensuring any pre-existing default route(s) via any other interface(s) continue to be selected as the preferred forwarding path for network traffic.

When the command is used, the static default route is deleted from the RIB, the distance value of the route is modified to the configured distance value, then it is reinstalled into the RIB.

Examples To configure vlan10 as a DHCP client and to set the AD for the default route added by DHCP to 150, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# ip address dhcp
awplus(config-if)# ip dhcp-client default-route distance 150
```

To set the AD for the default route back to the default value of 1, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip dhcp-client default-route distance
```

Related commands [show ip route](#)
[show ip route database](#)

Command changes Version 5.4.7-0.2 Command added.

ip dhcp-client request vendor-identifying-specific

Overview Use this command to add vendor-identifying vendor-specific information (option 125) requests to the DHCP discovery packets sent by an interface. This option, along with option 124, can be used to send vendor-specific information back to a DHCP client.

See RFC3925 for more information on Vendor-Identifying Vendor Options for DHCPv4.

Use the **no** variant of this command to remove the vendor-identifying-specific request from an interface.

Syntax `ip dhcp-client request vendor-identifying-specific`
`no ip dhcp-client request vendor-identifying-specific`

Default The vendor-identifying-specific request is not configured by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes The DHCP client must be activated on the interface, using the **ip address dhcp** command, so that DHCP discovery packets are sent.

Example To add the vendor-identifying-specific request on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-client request vendor-identifying-specific
```

To remove the vendor-identifying-specific request on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-client request vendor-identifying-specific
```

Related commands **ip address dhcp**
ip dhcp-client vendor-identifying-class

Command changes Version 5.4.7-2.1: command added

ip dhcp-client vendor-identifying-class

Overview Use this command to add a vendor-identifying vendor class (option 124) to the DHCP discovery packets sent by an interface. This option places the Allied Telesis Enterprise number (207) into the discovery packet. Option 124, along with option 125, can be used to send vendor-specific information back to a DHCP client.

See RFC3925 for more information on Vendor-Identifying Vendor Options for DHCPv4.

Use the **no** variant of this command to remove the vendor-identifying-class from an interface.

Syntax ip dhcp-client vendor-identifying-class
no ip dhcp-client vendor-identifying-class

Default The vendor-identifying-class is not configured by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes The DHCP client must be activated on the interface, using the **ip address dhcp** command, so that DHCP discovery packets are sent.

Example To remove the vendor-identifying-class on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-client vendor-identifying-class
```

Related commands **ip address dhcp**
ip dhcp-client request vendor-identifying-specific

Command changes Version 5.4.7-2.1: command added

ip dhcp-relay agent-option

Overview This command enables the DHCP Relay Agent to insert the DHCP Relay Agent Information Option (Option 82) into the client-request packets that it relays to its DHCP server. This allows the DHCP Relay Agent to pass on information to the server about the network location of the client device. The DHCP Relay Agent strips the DHCP Relay Agent Option 82 field out of the DHCP server's response, so that the DHCP client never sees this field.

When the DHCP Relay Agent appends its DHCP Relay Agent Option 82 data into the packet, it first overwrites any pad options present; then if necessary, it increases the packet length to accommodate the DHCP Relay Agent Option 82 data.

The **no** variant of this command stops the DHCP Relay Agent from appending the Option 82 field onto DHCP requests before forwarding it to the server.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

NOTE: *ip dhcp-relay agent-optionip dhcp-relay information policy*

Syntax ip dhcp-relay agent-option
no ip dhcp-relay agent-option

Default DHCP Relay Agent Information Option (Option 82) insertion is disabled by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes Use this command to alter the DHCP Relay Agent Option 82 setting when your device is the first hop for the DHCP client. To limit the maximum length of the packet, use the [ip dhcp-relay max-message-length](#) command.

This command cannot be enabled if DHCP snooping is enabled on your device ([service dhcp-snooping](#)), and vice versa.

Examples To make the DHCP Relay Agent listening on vlan2 append the DHCP Relay Agent Option 82 field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option
```

To stop the DHCP Relay Agent from appending the DHCP Relay Agent Option 82 field on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option
```

Related commands [**ip dhcp-relay agent-option remote-id**](#)
[**ip dhcp-relay information policy**](#)
[**ip dhcp-relay max-message-length**](#)
[**service dhcp-relay**](#)

ip dhcp-relay agent-option checking

Overview This command enables the DHCP Relay Agent to check DHCP Relay Agent Information Option (Option 82) information in response packets returned from DHCP servers. If the information does not match the information it has for its own client (downstream) interface then the DHCP Relay Agent drops the packet. Note that **ip dhcp-relay agent-option** must be configured.

The DHCP Relay Agent Option 82 field is included in relayed client DHCP packets if:

- DHCP Relay Agent Option 82 is enabled (**ip dhcp-relay agent-option**), and
- DHCP Relay Agent is enabled on the device (**service dhcp-relay**)

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the **DHCP Feature Overview and Configuration Guide**.

Syntax ip dhcp-relay agent-option checking
no ip dhcp-relay agent-option checking

Mode Interface Configuration for VLAN interfaces.

Examples To make the DHCP Relay Agent listening on vlan2 check the DHCP Relay Agent Information Option (Option 82) field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option
awplus(config-if)# ip dhcp-relay agent-option checking
```

To stop the DHCP Relay Agent on vlan2 from checking the DHCP Relay Agent Information Option (Option 82) field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option checking
```

Related commands **ip dhcp-relay agent-option**
ip dhcp-relay agent-option remote-id
ip dhcp-relay information policy
service dhcp-relay

ip dhcp-relay agent-option remote-id

Overview Use this command to specify the Remote ID sub-option of the DHCP Relay Agent Option 82 field the DHCP Relay Agent inserts into clients' request packets. The Remote ID identifies the device that is inserting the DHCP Relay Agent Option 82 information. If a Remote ID is not specified, the Remote ID sub-option is set to the device's MAC address.

Use the **no** variant of this command to return the Remote ID for an interface.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay agent-option remote-id <remote-id>`
`no ip dhcp-relay agent-option remote-id`

Parameter	Description
<code><remote-id></code>	An alphanumeric (ASCII) string, 1 to 63 characters in length. Additional characters allowed are hyphen (-), underscore (_), and hash (#). Spaces are not allowed.

Default The Remote ID is set to the device's MAC address by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes The Remote ID sub-option is included in the DHCP Relay Agent Option 82 field of relayed client DHCP packets if:

- DHCP Relay Agent Option 82 is enabled ([ip dhcp-relay agent-option](#)), and
- DHCP Relay Agent is enabled on the device ([service dhcp-relay](#))

Examples To set the Remote ID to myid for client DHCP packets received on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option remote-id myid
```

To remove the Remote ID specified for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option remote-id
```

Related commands [ip dhcp-relay agent-option](#)
[ip dhcp-relay agent-option checking](#)
[show ip dhcp-relay](#)

ip dhcp-relay agent-option subscriber-id

Overview Use this command to set an ASCII string as a subscriber identifier for a port.

Use the **no** variant of this command to unset the string as a subscriber identifier for a port.

Syntax ip dhcp-relay agent-option subscriber-id <subscriber-id>
no ip dhcp-relay agent-option subscriber-id

Parameter	Description
<subscriber-id>	An alphanumeric string to use as a client identifier. It is from 1 to 63 characters in length. This string may also contain special characters '#', '-', '_' and '.'.

Default No string is set.

Mode Interface Configuration

Usage notes The subscriber identifier is used by the relay agent to add a subscriber identifier sub-option to the relay-agent information option added by the relay-agent before forwarding the client packets coming from the switch port to the server. The agent option fields in responses sent from the servers to clients are stripped before forwarding such responses back to the client.

Example To set subscriber identifier 'office-1' to packets coming from the client directly connected to port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# ip dhcp-relay agent-option subscriber-id
office-1
```

Output The following shows typical output.

Example output from show interface

```
awplus#show interface port1.0.1
Interface port1.0.1
  Scope: both
  Link is DOWN, administrative state is UP
  Thrash-limiting
    Status Not Detected, Action learn-disable, Timeout 1(s)
  Hardware is Ethernet, address is e01a.ea60.087f
  index 5010 metric 1 mru 1500
  configured duplex auto, configured speed auto, configured polarity auto
  <UP,BROADCAST,MULTICAST>
  SNMP link-status traps: Disabled
  DHCP subscriber-id substitution for client-id is not enabled
  DHCP subscriber-id is office-1
    input packets 0, bytes 0, dropped 0, multicast packets 0
    output packets 0, bytes 0, multicast packets 0, broadcast packets 0
    input average rate : 30 seconds 0 bps, 5 minutes 0 bps
    output average rate: 30 seconds 0 bps, 5 minutes 0 bps
  Time since last state change: 0 days 17:51:00
```

Related [show interface](#)
commands

Command Version 5.5.2-0.1: command added
changes

ip dhcp-relay information policy

Overview This command sets the policy for how the DHCP relay deals with packets arriving from the client that contain DHCP Relay Agent Option 82 information.

If the command **ip dhcp-relay agent-option** has not been configured, then this command has no effect at all - no alteration is made to Option 82 information in packets arriving from the client side.

However, if the command **ip dhcp-relay agent-option** has been configured, this command modifies how the DHCP relay service deals with cases where the packet arriving from the client side already contains DHCP Relay Agent Option 82 information.

This command sets the action that the DHCP relay should take when a received DHCP client request contains DHCP Relay Agent Option 82 information.

By default, the DHCP Relay Agent replaces any existing DHCP Relay Agent Option 82 field with its own DHCP Relay Agent field. This is equivalent to the functionality of the **replace** parameter.

The **no** variant of this command returns the policy to the default behavior - i.e. replacing the existing DHCP Relay Agent Option 82 field.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

NOTE: *ip dhcp-relay agent-optionip dhcp-relay information policy*

Syntax ip dhcp-relay information policy {append|drop|keep|replace}
no ip dhcp-relay information policy

Parameter	Description
append	The DHCP Relay Agent appends the DHCP Relay Agent Option 82 field of the packet with its own DHCP Relay Agent Option 82 details.
drop	The DHCP Relay Agent discards the packet.
keep	The DHCP Relay Agent forwards the packet without altering the DHCP Relay Agent Option 82 field.
replace	The DHCP Relay Agent replaces the existing DHCP Relay Agent details in the DHCP Relay Agent Option 82 field with its own details before forwarding the packet.

Mode Interface Configuration for VLAN interfaces.

Examples To make the DHCP Relay Agent listening on vlan2 drop any client requests that already contain DHCP Relay Agent Option 82 information, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay information policy drop
```

To reset the DHCP relay information policy to the default policy for interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay information policy
```

Related commands [ip dhcp-relay agent-option](#)
[ip dhcp-relay agent-option checking](#)
[service dhcp-server](#)

ip dhcp-relay maxhops

Overview This command sets the hop count threshold for discarding BOOTP messages. When the hops field in a BOOTP message exceeds the threshold, the DHCP Relay Agent discards the BOOTP message. The hop count threshold is set to 10 hops by default.

Use the **no** variant of this command to reset the hop count to the default.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay maxhops <1-255>`
`no ip dhcp-relay maxhops`

Parameter	Description
<1-255>	The maximum hop count value.

Default The default hop count threshold is 10 hops.

Mode Interface Configuration for VLAN interfaces.

Example To set the maximum number of hops to 5 for packets received on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay maxhops 5
```

Related commands [service dhcp-relay](#)

ip dhcp-relay max-message-length

Overview This command applies when the device is acting as a DHCP Relay Agent and DHCP Relay Agent Option 82 insertion is enabled. It sets the maximum DHCP message length (in bytes) for the DHCP packet with its DHCP Relay Agent Option 82 data inserted. From this value it calculates the maximum packet size that it will accept at its input. Packets that arrive greater than this value will be dropped.

The **no** variant of this command sets the maximum message length to its default of 1400 bytes.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay max-message-length <548-1472>`
`no ip dhcp-relay max-message-length`

Parameter	Description
<code><548-1472></code>	The maximum DHCP message length (this is the message header plus the inserted DHCP option fields in bytes).

Default The default is 1400 bytes.

Mode Interface Configuration for VLAN interfaces.

Usage notes When a DHCP Relay Agent (that has DHCP Relay Agent Option 82 insertion enabled) receives a request packet from a DHCP client, it will append the DHCP Relay Agent Option 82 component data, and forward the packet to the DHCP server. The DHCP client will sometimes issue packets containing pad option fields that can be overwritten with Option 82 data.

Where there are insufficient pad option fields to contain all the DHCP Relay Agent Option 82 data, the DHCP Relay Agent will increase the packet size to accommodate the DHCP Relay Agent Option 82 data. If the new (increased) packet size exceeds that defined by the **maximum-message-length** parameter, then the DHCP Relay Agent will drop the packet.

NOTE: [ip dhcp-relay agent-option](#)

Example To set the maximum DHCP message length to 1200 bytes for packets arriving in interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay max-message-length 1200
```

To reset the maximum DHCP message length to the default of 1400 bytes for packets arriving in interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay max-message-length
```

Related commands [service dhcp-relay](#)

ip dhcp-relay server-address

Overview

This command adds a DHCP server for the DHCP Relay Agent to forward client DHCP packets to on a particular interface. You can add up to five DHCP servers on each device interface that the DHCP Relay Agent is listening on.

The **no** variant of this command deletes the specified DHCP server from the list of servers available to the DHCP relay agent.

The **no ip dhcp-relay** command removes all DHCP relay settings from the interface.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay server-address {<ipv4-address>|<ipv6-address> <server-interface>}`
`no ip dhcp-relay server-address {<ipv4-address>|<ipv6-address> <server-interface>}`
`no ip dhcp-relay`

Parameter	Description
<i><ipv4-address></i>	Specify the IPv4 address of the DHCP server for the DHCP Relay Agent to forward client DHCP packets to, in dotted decimal notation. The IPv4 address uses the format A.B.C.D.
<i><ipv6-address></i>	Specify the IPv6 address of the DHCPv6 server for the DHCPv6 Relay Agent to forward client DHCP packets to, in hexadecimal notation.
<i><server-interface></i>	Specify the interface name of the DHCPv6 server. It is only required for a DHCPv6 server with an IPv6 address.

Mode Interface Configuration for VLAN interfaces.

Usage notes For a DHCP server with an IPv6 address you must specify the interface for the DHCP server. See examples below for configuration differences between IPv4 and IPv6 DHCP relay servers.

See also the [service dhcp-relay](#) command to enable the DHCP Relay Agent on your device. The [ip dhcp-relay server-address](#) command defines a relay destination on an interface on the device, needed by the DHCP Relay Agent to relay DHCP client packets to a DHCP server.

Examples: To enable the DHCP Relay Agent to relay DHCP packets on interface vlan2 to the DHCP server with the IPv4 address 192.0.2.200, use the commands:

DHCP for IPv4

```
awplus# configure terminal
awplus(config)# service dhcp-relay
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay server-address 192.0.2.200
```

To remove the DHCP server with the IPv4 address 192.0.2.200 from the list of servers available to the DHCP Relay Agent on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay server-address 192.0.2.200
```

Examples: To enable the DHCP Relay Agent on your device to relay DHCP packets on interface vlan10 to the DHCP server with the IPv6 address 2001:0db8:010d::1 on interface vlan20, use the commands:

DHCPv6

```
awplus# configure terminal
awplus(config)# service dhcp-relay
awplus(config)# interface vlan10
awplus(config-if)# ip dhcp-relay server-address
2001:0db8:010d::1 vlan20
```

To remove the DHCP server with the IPv6 address 2001:0db8:010d::1 on interface vlan20 from the list of servers available to the DHCP Relay Agent on interface vlan10, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip dhcp-relay server-address
2001:0db8:010d::1 vlan20
```

Example: To disable DHCP relay on vlan2, use the commands:

disabling DHCP relay

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay
```

Related commands [service dhcp-relay](#)

ip dhcp-relay short-lease

Overview Use this command to reduce the amount of time an IP address is assigned to a client device.

Long lease times can cause issues in dynamic networks where client devices frequently move between segments, such as VLANs. These device may retain an outdated IP address from its previous VLAN, disrupting communication.

This command is particularly useful in networks with a high turnover of devices or in environments where IP addresses are scarce.

Use the **no** variant of this command to remove the short lease time configuration.

Syntax `ip dhcp-relay short-lease <20-3600>`
`no ip dhcp-relay short-lease`

Parameter	Description
<20-3600>	The lease time for DHCP relay in seconds.

Default Not set

Mode Interface Configuration

Example To configure a DHCP Relay on interface vlan1 with a lease time of 200 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip dhcp-relay short-lease 200
```

Related commands [show ip dhcp-relay](#)

Command changes Version 5.5.4-2.1: command added

ip dhcp-relay use-client-side-address

Overview Use this command to configure DHCP-Relay to use the client-side interface (that is the interface receiving the DHCP client packets) IP address as the source address of the relayed DHCP packets.

Use the **no** variant of this command to disable the use of the client-side interface IP address as the source IP address for relayed DHCP packets.

Syntax `ip dhcp-relay use-client-side-address`
`no ip dhcp-relay use-client-side-address`

Parameter	Description
<code>use-client-side-address</code>	Use the client side interface IP address as the source IP address for relayed DHCP packets.

Default By default, the server-side interface IP address is used as the source IP address of DHCP relayed packets.

Mode Global Configuration

Usage notes In most cases, there are filters placed between the DHCP relay and DHCP server which only allow DHCP packets from the client subnet to the server and back. This command allows you to configure the DHCP relay so that the relay will use the IP address of the interface **receiving** clients' DHCP requests to be used as the source IP address of the relayed DHCP packets.

Example To configure the client-side IP address as the source IP address of DHCP relayed packets, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp-relay use-client-side-address
```

Output The following shows typical output.

Example output from show ip dhcp-relay

```
awplus#sh ip dhcp-relay
DHCP Relay Service is enabled
Use of client side address as source address is enabled
...
```

The second line of the display output shows the status of the client-side address being enabled as the source IP address.

Related commands [ip dhcp-relay server-address](#)

Command changes Version 5.4.9-0.7: command added

ip dhcp-relay use-dhcp-relay-ip

Overview Use this command to configure the device to use its own IP address in the "Server ID" option, when acting as a DHCP relay agent. By default, the device uses the address of the DHCP server instead.

You may find this command useful if the relay agent is configured to provide short lease times. This command can prevent the client from bypassing the relay agent and ending up with a longer lease from the server.

Use the **no** variant of this command to return to the default behavior.

Syntax `ip dhcp-relay use-dhcp-relay-ip`
`no ip dhcp-relay use-dhcp-relay-ip`

Default Disabled

Mode Global Configuration

Example To use the device's own IP address as the server ID, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp-relay use-dhcp-relay-ip
```

To return to using the DHCP server's IP address as the server ID, use the commands:

```
awplus# configure terminal
awplus(config)# no ip dhcp-relay use-dhcp-relay-ip
```

Related commands [show ip dhcp-relay](#)

Command changes Version 5.5.5-0.1: command added

ip dhcp use-subscriber-id

Overview Use this command in Global Configuration mode to configure the DHCP server to use the subscriber identifier substitution for the client identifier on all DHCP packets coming from all switch ports.

Use this command in Interface Configuration mode to configure a DHCP server to use the subscriber identifier substitution for the client identifier on all DHCP packets coming from a DHCP client directly connected to an interface.

Use the **no** variant of this command to disable the configuration.

Syntax ip dhcp use-subscriber-id
no ip dhcp use-subscriber-id

Default Disabled

Mode Global Configuration
Interface Configuration

Usage notes In Global Configuration mode, other DHCP packets coming from other interface types, for example Ethernet, are not affected by this command.

In Interface Configuration mode, the subscriber-id used in the substitution is derived from the port name of an interface. For example, for a DHCP packet coming in from a DHCP client directly attached to switchport port1.0.1, the subscriber-id is port1.0.1. This subscriber identifier for the client identifier substitution can only be applied to packets coming from switchport interfaces, consequently this command is only applicable to switchport interfaces.

Example 1 In Global Configuration mode, to configure the subscriber-id client-id substitution for the DHCP packets coming from all switch port interfaces, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp use-subscriber-id
```

Output The following shows typical output.

Example output from show ip dhcp server summary

```
awplus#show ip dhcp server summary

DHCP Server service is enabled
DHCP Server is running
BOOTP ignore is disabled
DHCP leasequery support is disabled
DHCP subscriber-id substitution for client-id is enabled
Pool list: pool_direct pool_relay Campus-1
```

Example 2 In Interface Configuration mode, to configure subscriber identifier substitution for the client identifier on packets sent by a DHCP client directly attached to port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# ip dhcp use-subscriber-id
```

Output The following shows typical output.

Example output from show interface

```
awplus#show interface port1.0.1
Interface port1.0.1
  Scope: both
  Link is DOWN, administrative state is UP
  Thrash-limiting
    Status Not Detected, Action learn-disable, Timeout 1(s)
  Hardware is Ethernet, address is e01a.ea60.087f
  index 5010 metric 1 mru 1500
  configured duplex auto, configured speed auto, configured
  polarity auto

  SNMP link-status traps: Disabled
  DHCP subscriber-id substitution for client-id is enabled
  DHCP subscriber-id is office-1
    input packets 0, bytes 0, dropped 0, multicast packets 0
    output packets 0, bytes 0, multicast packets 0, broadcast
    packets 0
    input average rate : 30 seconds 0 bps, 5 minutes 0 bps
    output average rate: 30 seconds 0 bps, 5 minutes 0 bps
  Time since last state change: 0 days 17:51:00
```

Related commands [show ip dhcp server summary](#)
[show interface](#)

Command changes Version 5.5.2-0.1: command added

lease

Overview This command sets the expiration time for a leased address for the DHCP address pool you are configuring. The time set by the days, hours, minutes and seconds is cumulative. The minimum total lease time that can be configured is 20 seconds. The maximum total lease time that can be configured is 120 days.

Note that if you add a user-defined option 51 using the **option** command, then you will override any settings created with this command. Option 51 specifies a lease time of 1 day.

Use the **infinite** parameter to set the lease expiry time to infinite (leases never expire).

Use the **no** variant of this command to return the lease expiration time back to the default of one day.

Syntax lease <days> <hours> <minutes> [<seconds>]
lease infinite
no lease

Parameter	Description
<days>	The number of days, from 0 to 120, that the lease expiry time is configured for. Default: 1
<hours>	The number of hours, from 0 to 24, that the lease expiry time is configured for. Default: 0
<minutes>	The number of minutes, from 0 to 60, the lease expiry time is configured for. Default: 0
<seconds>	The number of seconds, from 0 to 60, the lease expiry time is configured for.
infinite	The lease never expires.

Default The default lease time is 1 day.

Mode DHCP Configuration

Examples To set the lease expiration time for address pool P2 to 35 minutes, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# lease 0 0 35
```

To set the lease expiration time for the address pool Nerv_Office to 1 day, 5 hours, and 30 minutes, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool Nerv_Office
awplus(dhcp-config)# lease 1 5 30
```

To set the lease expiration time for the address pool P3 to 20 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P3
awplus(dhcp-config)# lease 0 0 0 20
```

To set the lease expiration time for the pool to never expire, use the command:

```
awplus(dhcp-config)# lease infinite
```

To return the lease expiration time to the default of one day, use the command:

```
awplus(dhcp-config)# no lease
```

Related commands [option](#)
[service dhcp-server](#)
[short-lease-threshold](#)

network (DHCP)

Overview This command sets the network (subnet) that the DHCP address pool applies to.

The **no** variant of this command removes the network (subnet) from the DHCP address pool.

Syntax `network {<ip-subnet-address/prefix-length>|<ip-subnet-address/mask>}`
`no network`

Parameter	Description
<code><ip-subnet-address/prefix-length></code>	The IPv4 subnet address in dotted decimal notation followed by the prefix length in slash notation.
<code><ip-subnet-address/mask></code>	The IPv4 subnet address in dotted decimal notation followed by the subnet mask in dotted decimal notation.

Mode DHCP Configuration

Usage notes This command will fail if it would make existing ranges invalid. For example, if they do not lie within the new network you are configuring.

The **no** variant of this command will fail if ranges still exist in the pool. You must remove all ranges in the pool before issuing a **no network** command to remove a network from the pool.

Examples To configure a network for the address pool P2, where the subnet is 192.0.2.5 and the mask is 255.255.255.0, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# network 192.0.2.5/24
```

or you can use dotted decimal notation instead of slash notation for the subnet-mask:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# network 192.0.2.5 255.255.255.0
```

Related commands [service dhcp-server](#)
[subnet-mask](#)

next-server

Overview This command sets the next server address for a DHCP server pool. It is the address of the next server that the client should use in its bootstrap process.

The **no** variant of this command removes the next server address from the DHCP address pool.

Syntax next-server <ip-address>
no next-server

Parameter	Description
<ip-address>	The server IP address, entered in dotted decimal notation.

Mode DHCP Configuration

Example To set the next-server address for the address pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# next-server 192.0.2.2
```


option

Overview This command adds a user-defined option to the DHCP address pool you are configuring. For the **hex**, **integer**, and **flag** option types, if the option already exists, the new option overwrites the existing option's value. Options with an **ip** type can hold a list of IP addresses or masks (i.e. entries that have the A.B.C.D address format), so if the option already exists in the pool, then the new IP address is added to the list of existing IP addresses.

Options with the same number as one of the pre-defined options override the standard option definition. The pre-defined options use the option numbers 1, 3, 6, 15, and 51.

The **no** variant of this command removes the specified user-defined option from the DHCP pool, or all user-defined options from the DHCP pool.

Syntax option [*<1-254>*|*<option-name>*] *<option-value>*
no option [*<1-254>*|*<option-value>*]

Parameter	Description
<i><1-254></i>	The option number of the option. Options with the same number as one of the standard options overrides the standard option definition.
<i><option-name></i>	Option name associated with the option.
<i><option-value></i>	The option value. You must specify a value that is appropriate to the option type:
	hex A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long.
	ip An IPv4 address or mask that has the dotted decimal A.B.C.D notation. To create a list of IP addresses, you must add each IP address individually using the option command multiple times.
	integer A number from 0 to 4294967295.
	flag A value of either true, on, or enabled to set the flag, or false, off or disabled to unset the flag.

Mode DHCP Configuration

Examples To add the ASCII-type option named `tftp-server-name` to the pool P2 and give the option the value `server1`, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# option tftp-server-name server1
```

To add the hex-type option named `tcpip-node-type` to the pool P2 and give the option the value `08af`, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# option tcpip-node-type 08af
```

To add multiple IP addresses for the ip-type option 175, use the command:

```
awplus(dhcp-config)# option 175 192.0.2.6
awplus(dhcp-config)# option 175 192.0.2.12
awplus(dhcp-config)# option 175 192.0.2.33
```

To add the option 179 to a pool, and give the option the value 123456, use the command:

```
awplus(dhcp-config)# option 179 123456
```

To add a user-defined flag option with the name `perform-router-discovery`, use the command:

```
awplus(dhcp-config)# option perform-router-discovery yes
```

To clear all user-defined options from a DHCP address pool, use the command:

```
awplus(dhcp-config)# no option
```

To clear a user-defined option, named `tftp-server-name`, use the command:

```
awplus(dhcp-config)# no option tftp-server-name
```

Related commands

- [dns-server](#)
- [ip dhcp option](#)
- [lease](#)
- [service dhcp-server](#)
- [show ip dhcp pool](#)

probe enable

Overview Use this command to enable lease probing for a DHCP pool. Probing is used by the DHCP server to check if an IP address it wants to lease to a client is already being used by another host.

The **no** variant of this command disables probing for a DHCP pool.

Syntax probe enable
no probe enable

Default Probing is enabled by default.

Mode DHCP Pool Configuration

Examples To enable probing for pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# probe enable
```

To disable probing for pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no probe enable
```

Related commands

- ip dhcp pool**
- probe packets**
- probe timeout**
- probe type**
- show ip dhcp pool**

probe packets

Overview Use this command to specify the number of packets sent for each lease probe. Lease probing is configured on a per-DHCP pool basis. When set to 0 probing is effectively disabled.

The **no** variant of this command sets the number of probe packets sent to the default of 5.

Syntax probe packets <0-10>
no probe packets

Parameter	Description
<0-10>	The number of probe packets sent.

Default The default is 5.

Mode DHCP Pool Configuration

Examples To set the number of probe packets to 2 for pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# probe packets 2
```

To set the number of probe packets to the default 5 for pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no probe packets
```

Related commands [probe enable](#)
[probe timeout](#)
[probe type](#)
[show ip dhcp pool](#)

probe timeout

Overview Use this command to set the timeout value in milliseconds that the server waits for a response after each probe packet is sent. Lease probing is configured on a per-DHCP pool basis.

The **no** variant of this command sets the probe timeout value to the default setting, 200 milliseconds.

Syntax probe timeout <50-5000>
no probe timeout

Parameter	Description
<50-5000>	Timeout interval in milliseconds.

Default The default timeout interval is 200 milliseconds.

Mode DHCP Pool Configuration

Examples To set the probe timeout value to 500 milliseconds for pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# probe timeout 500
```

To set the probe timeout value for pool P2 to the default, 200 milliseconds, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no probe timeout
```

Related commands

- [probe enable](#)
- [probe packets](#)
- [probe type](#)
- [show ip dhcp pool](#)

probe type

Overview Use this command to set the probe type for a DHCP pool. The probe type specifies how the DHCP server checks whether an IP address is being used by other hosts, referred to as lease probing. If **arp** is specified, the server sends an ARP request to determine if an address is in use. If **ping** is specified, the server will send an ICMP Echo Request (ping).

The **no** variant of this command sets the probe type to the default setting, ping.

Syntax probe type {arp|ping}
no probe type

Parameter	Description
arp	Probe using ARP.
ping	Probe using ping.

Default The default probe type is ping.

Mode DHCP Pool Configuration

Examples To set the probe type to arp for the pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# probe type arp
```

To set the probe type for the pool P2 to the default, ping, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no probe type
```

Related commands

- [ip dhcp pool](#)
- [probe enable](#)
- [probe packets](#)
- [probe timeout](#)
- [show ip dhcp pool](#)

range

Overview This command adds an address range to the DHCP address pool you are configuring. The DHCP server responds to client requests received from the pool's network. It assigns an IP addresses within the specified range. The IP address range must lie within the network. You can add multiple address ranges and individual IP addresses for a DHCP pool by using this command multiple times.

The **no** variant of this command removes an address range from the DHCP pool. Use the **no range all** command to remove all address ranges from the DHCP pool.

Syntax `range <ip-address> [<ip-address>]`
`no range <ip-address> [<ip-address>]`
`no range all`

Parameter	Description
<code><ip-address></code>	IPv4 address range for DHCP clients, in dotted decimal notation. The first IP address is the low end of the range, the second IP address is the high end. Specify only one IP address to add an individual IP address to the address pool.

Mode DHCP Configuration

Examples To add an address range of 192.0.2.5 to 192.0.2.16 to the pool Nerv_Office, use the command:

```
awplus# configure terminal
awplus(config)# ip dhcp pool Nerv_Office
awplus(dhcp-config)# range 192.0.2.5 192.0.2.16
```

To add the individual IP address 192.0.2.2 to a pool, use the command:

```
awplus(dhcp-config)# range 192.0.2.2
```

To remove all address ranges from a pool, use the command:

```
awplus(dhcp-config)# no range all
```

Related commands [ip dhcp pool](#)
[service dhcp-server](#)
[show ip dhcp pool](#)

route

Overview This command allows the DHCP server to provide static routes to clients.

Syntax route A.B.C.D/M A.B.C.D {both|opt249|rfc3442}

Parameter	Description
A.B.C.D/M	Subnet for the route
A.B.C.D	Next hop for the route
both	opt249 and rfc3442
opt249	Classless static route option for DHCP
rfc3442	Classless static route option for DHCP

Mode DHCP Configuration

Examples To distribute static routes for route 0.0.0.0/0 whose next hop is 192.16.1.1 to clients using both opt249 and rfc3442, use the command:

```
awplus# configure terminal
awplus(config)# ip dhcp pool pubic
awplus(dhcp-config)# route 0.0.0.0/0 192.16.1.1 both
```

Related commands [ip dhcp pool](#)

service dhcp-relay

Overview This command enables the DHCP Relay Agent on the device. However, on a given IP interface, no DHCP forwarding takes place until at least one DHCP server is specified to forward/relay all clients' DHCP packets to.

The **no** variant of this command disables the DHCP Relay Agent on the device for all interfaces.

Syntax service dhcp-relay
no service dhcp-relay

Mode Global Configuration

Usage notes A maximum number of 400 DHCP Relay Agents (one per interface) can be configured on the device. Once this limit has been reached, any further attempts to configure DHCP Relay Agents will not be successful.

Default The DHCP-relay service is enabled by default.

Examples To enable the DHCP relay global function, use the commands:

```
awplus# configure terminal
awplus(config)# service dhcp-relay
```

To disable the DHCP relay global function, use the commands:

```
awplus# configure terminal
awplus(config)# no service dhcp-relay
```

Related commands

- [ip dhcp-relay agent-option](#)
- [ip dhcp-relay agent-option checking](#)
- [ip dhcp-relay information policy](#)
- [ip dhcp-relay maxhops](#)
- [ip dhcp-relay server-address](#)

service dhcp-server

Overview This command enables the DHCP server on your device. The server then listens for DHCP requests on all IP interfaces. It will not run if there are no IP interfaces configured.

The **no** variant of this command disables the DHCP server.

Syntax service dhcp-server
no service dhcp-server

Mode Global Configuration

Example To enable the DHCP server, use the commands:

```
awplus# configure terminal
awplus(config)# service dhcp-server
```

Related commands [ip dhcp pool](#)
[show ip dhcp server summary](#)
[subnet-mask](#)

short-lease-threshold

Overview Use this command to configure a short lease threshold.

Use the **no** variant of this command to return the short lease threshold to the default of one minute.

Syntax short-lease-threshold <hours> <minutes>
no short-lease-threshold

Parameter	Description
<hours>	The number of hours, from 0 to 24.
<minutes>	The number of minutes, from 0 to 60.

Default 1 minute.

Mode DHCP Configuration

Usage notes DHCP leases need to be backed up in NVS so that when the DHCP server reboots or goes through a power cycle it won't lose all the knowledge of these leases.

Some networks have a high number of mobile devices repeatedly requesting DHCP leases every few seconds before their existing lease expires. This can happen for example, when mobile devices move in and out of a Wi-Fi zone or when Wi-Fi signal strength changes. This means the same IP address can have multiple lease entries which can take up unnecessary backup file space.

The **short-lease-threshold** command allows you to configure the threshold for a short lease, from 1 minute to 24 hours. Any lease less than the threshold is deemed to be a short lease and will NOT be backed up to NVS.

This is useful if you have:

- limited backup file space, and
- you don't need to restore leases after a device reboot or power cycle

Example To set the short lease threshold for address pool P2 to 40 minutes, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# short-lease-threshold 0 40
```

To set the short lease threshold for address pool Nerv_Office to 5 hours and 35 minutes, use the following commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool Nerv_Office
awplus(dhcp-config)# short-lease-threshold 5 35
```

To return the short lease threshold to the default of one minute, use the following commands:

```
awplus# configure terminal
awplus(config)# no short-lease-threshold
```

**Related
commands
Command
changes**

lease

Version 5.4.8-2.1: command added

show counter dhcp-client

Overview This command shows counters for the DHCP client on your device.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show counter dhcp-client

Mode User Exec and Privileged Exec

Example To display the message counters for the DHCP client on your device, use the command:

```
awplus# show counter dhcp-client
```

Output The following shows typical output.

Example output from the show counter dhcp-client command

```
show counter dhcp-client

DHCPDISCOVER out      ..... 10
DHCPREQUEST out       ..... 34
DHCPDECLINE out       ..... 4
DHCPRELEASE out       ..... 0
DHCPOFFER in          ..... 22
DHCPACK in            ..... 18
DHCPNAK in            ..... 0
```

Parameters in the output of the show counter dhcp-client command

Parameter	Description
DHCPDISCOVER out	The number of DHCP Discover messages sent by the client.
DHCPREQUEST out	The number of DHCP Request messages sent by the client.
DHCPDECLINE out	The number of DHCP Decline messages sent by the client.
DHCPRELEASE out	The number of DHCP Release messages sent by the client.
DHCPOFFER in	The number of DHCP Offer messages received by the client.
DHCPACK in	The number of DHCP Acknowledgement messages received by the client.
DHCPNAK in	The number of DHCP Negative Acknowledgement messages received by the client.

Related [ip address dhcp commands](#)

show counter dhcp-relay

Overview This command shows counters for the DHCP Relay Agent on your device.
For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show counter dhcp-relay

Mode User Exec and Privileged Exec

Examples To display counters for the DHCP Relay Agent on your device, use the following command:

```
awplus# show counter dhcp-relay
```

Output The following shows typical output.

Example output from the show counter dhcp-relay command

```
awplus#show counter dhcp-relay

DHCP relay counters
Requests In           ..... 4
Replies In            ..... 4
Relayed To Server     ..... 4
Relayed To Client     ..... 4
Out To Server Failed  ..... 0
Out To Client Failed  ..... 0
Invalid hlen          ..... 0
Bogus giaddr          ..... 0
Corrupt Agent Option  ..... 0
Missing Agent Option  ..... 0
Bad Circuit ID        ..... 0
Missing Circuit ID     ..... 0
Bad Remote ID         ..... 0
Missing Remote ID     ..... 0
Option Insert Failed  ..... 0
DHCPv6 Requests In   ..... 0
DHCPv6 Replies In    ..... 0
DHCPv6 Relayed to Server ..... 0
DHCPv6 Relayed to Client ..... 0
```

Parameter	Description
Requests In	The number of DHCP Request messages received from clients.
Replies In	The number of DHCP Reply messages received from servers.
Relayed To Server	The number of DHCP Request messages relayed to servers.
Relayed To Client	The number of DHCP Reply messages relayed to clients.
Out To Server Failed	The number of failures when attempting to send request messages to servers. This is an internal debugging counter.
Out To Client Failed	The number of failures when attempting to send reply messages to clients. This is an internal debugging counter.
Invalid hlen	The number of incoming messages dropped due to an invalid hlen field.
Bogus giaddr	The number of incoming DHCP Reply messages dropped due to the bogus giaddr field.
Corrupt Agent Option	The number of incoming DHCP Reply messages dropped due to a corrupt relay agent information option field.

Parameter	Description
	Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command.
Missing Agent Option	The number of incoming DHCP Reply messages dropped due to a missing relay agent information option field. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command.
Bad Circuit ID	The number of incoming DHCP Reply messages dropped due to a bad circuit ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Missing Circuit ID	The number of incoming DHCP Reply messages dropped due to a missing circuit ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Bad Remote ID	The number of incoming DHCP Reply messages dropped due to a bad remote ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Missing Remote ID	The number of incoming DHCP Reply messages dropped due to a missing remote ID.

Parameter	Description
	Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Option Insert Failed	The number of incoming DHCP Request messages dropped due to an error adding the DHCP Relay Agent information (option-82). This counter increments when: - the DHCP Relay Agent is set to drop packets with the DHCP Relay Agent Option 82 field already filled by another DHCP Relay Agent. This policy is set with the ip dhcp-relay information policy command. - there is a packet error that stops the DHCP Relay Agent from being able to append the packet with its DHCP Relay Agent Information Option (Option 82) field.
DHCPv6 Requests In	The number of incoming DHCPv6 Request messages.
DHCPv6 Replies In	The number of incoming DHCPv6 Reply messages.
DHCPv6 Relayed to Server	The number of DHCPv6 messages relayed to the server.
DHCPv6 Relayed to Client	The number of DHCPv6 messages relayed to the client.

show counter dhcp-server

Overview This command shows counters for the DHCP server on your device.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show counter dhcp-server

Mode User Exec and Privileged Exec

Example To display counters for the DHCP server on your device, use the command:
awplus# show counter dhcp-server

Output The following shows typical output.

Example output from the show counter dhcp-server command

```
DHCP server counters
DHCPDISCOVER in      ..... 20
DHCPREQUEST in       ..... 12
DHCPDECLINE in        ..... 1
DHCPRELEASE in        ..... 0
DHCPINFORM in         ..... 0
DHCPOFFER out         ..... 8
DHCPACK out           ..... 4
DHCPNAK out           ..... 0
BOOTREQUEST in        ..... 0
BOOTREPLY out         ..... 0
```

Parameters in the output of the show counter dhcp-server command

Parameter	Description
DHCPDISCOVER in	The number of Discover messages received by the DHCP server.
DHCPREQUEST in	The number of Request messages received by the DHCP server.
DHCPDECLINE in	The number of Decline messages received by the DHCP server.
DHCPRELEASE in	The number of Release messages received by the DHCP server.
DHCPINFORM in	The number of Inform messages received by the DHCP server.
DHCPOFFER out	The number of Offer messages sent by the DHCP server.
DHCPACK out	The number of Acknowledgement messages sent by the DHCP server.
DHCPNAK out	The number of Negative Acknowledgement messages sent by the DHCP server. The server sends these after receiving a request that it cannot fulfil because either there are no available IP addresses in the related address pool, or the request has come from a client that doesn't fit the network setting for an address pool.
BOOTREQUEST in	The number of bootp messages received by the DHCP server from bootp clients.
BOOTREPLY out	The number of bootp messages sent by the DHCP server to bootp clients.

Related commands

- [service dhcp-server](#)
- [show ip dhcp binding](#)
- [show ip dhcp server statistics](#)
- [show ip dhcp pool](#)
- [show ip dhcp server statistics](#)

show dhcp lease

Overview This command shows details about the leases that the DHCP client has acquired from a DHCP server for interfaces on the device.

For information on filtering and saving command output, see “Controlling “show” Command Output” in the **“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide**.

Syntax show dhcp lease [<interface>]

Parameter	Description
<interface>	Interface name to display DHCP lease details for.

Mode User Exec and Privileged Exec

Example To show the current lease expiry times for all interfaces, use the command:

```
awplus# show dhcp lease
```

To show the current lease for vlan2, use the command:

```
awplus# show dhcp lease vlan2
```

Output The following shows typical output.

Example output from the show dhcp lease vlan1 command

Interface vlan1	

IP Address:	192.168.22.4
Expires:	13 Mar 2022 20:10:19
Renew:	13 Mar 2022 18:37:06
Rebind:	13 Mar 2022 19:49:29
Server:	
Options:	
subnet-mask	255.255.255.0
routers	19.18.2.100,12.16.2.17
dhcp-lease-time	3600
dhcp-message-type	5
domain-name-servers	192.168.100.50,19.88.200.33
dhcp-server-identifier	192.168.22.1
domain-name	alliedtelesis.com

Related commands [ip address dhcp](#)

show ip dhcp binding

Overview This command shows the lease bindings that the DHCP server has allocated clients.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip dhcp binding [*<ip-address>* | *<address-pool>*]

Parameter	Description
<i><ip-address></i>	IPv4 address of a leased IP address, in dotted decimal notation. This displays the lease information for the specified IP address.
<i><address-pool></i>	Name of an address pool. This displays the lease information for all clients within the address pool.

Mode User Exec and Privileged Exec

Examples To display all leases for every client in all address pools, use the command:

```
awplus# show ip dhcp binding
```

To display the details for the leased IP address 172.16.2.16, use the command:

```
awplus# show ip dhcp binding 172.16.2.16
```

To display the leases from the address pool MyPool, use the command:

```
awplus# show ip dhcp binding MyPool
```

Output The following shows typical output.

Example output from the show ip dhcp binding command

Pool 30_2_network Network 172.16.2.0/24			
DHCP Client Entries			
IP Address	ClientId	Type	Expiry
172.16.2.100	0050.fc82.9ede	Dynamic	21 Jun 2021 19:02:58
172.16.2.101	000e.a6ae.7c14	Static	Infinite
172.16.2.102	000e.a6ae.7c4c	Static	Infinite
172.16.2.103	000e.a69a.ac91	Static	Infinite
172.16.2.104	00e0.189d.5e41	Static	Infinite
172.16.2.150	00e0.2b04.5800	Static	Infinite
172.16.2.167	4444.4400.35c3	Dynamic	21 Jun 2021 14:58:41

Related commands

- clear ip dhcp binding**
- ip dhcp pool**
- lease**
- range**
- service dhcp-server**
- show ip dhcp pool**

show ip dhcp pool

Overview This command displays the configuration details and system usage of the DHCP address pools configured on the device.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip dhcp pool [*<address-pool>*]

Parameter	Description
<i><address-pool></i>	Name of a specific address pool. This displays the configuration of the specified address pool only.

Mode User Exec and Privileged Exec

Example awplus# show ip dhcp pool

Output The following shows typical output.

Example output from the show ip dhcp pool command

```
Pool p1 :
network: 192.168.1.0/24
address ranges:
  addr: 192.168.1.10 to 192.168.1.18
static host addresses:
  addr: 192.168.1.12      MAC addr: 1111.2222.3333
lease <days:hours:minutes:seconds> <1:0:0:0>
subnet mask: 255.255.255.0 (pool's network mask)
Probe:
  Status:      Enabled      [Enabled]
  Type:        ARP          [Ping]
  Packets:     2            [5]
  Timeout:     200 msecs    [200]
Dynamic addresses:
  Total:       8
  Leased:      2
  Utilization: 25.0 %
Static host addresses:
  Total:       1
  Leased:      1
```


Output The following shows typical output.

Example output from the show ip dhcp pool command with IP address 192.168.1.12 assigned to a VLAN interface on the device:

```
Pool p1 :
network: 192.168.1.0/24
address ranges:
  addr: 192.168.1.10 to 192.168.1.18
        (interface addr 192.168.1.12 excluded)
        (static host addr 192.168.1.12 excluded)
static host addresses:
  addr: 192.168.1.12      MAC addr: 1111.2222.3333
        (= interface addr, so excluded)
lease <days:hours:minutes:seconds> <1:0:0:0>
subnet mask: 255.255.255.0 (pool's network mask)
Probe:
  Status:      Enabled      Default Values
  Type:        ARP          [Enabled]
  Packets:     2            [Ping]
  Timeout:     200 msec     [5]
  Timeout:     200 msec     [200]
Dynamic addresses:
  Total:       8
  Leased:      2
  Utilization: 25.0 %
Static host addresses:
  Total:       1
  Leased:      1
```

Output The following shows typical output.

Example output from the show ip dhcp pool command when a host with MAC 0000.cd38.05f9 is registered as a static host by DHCP Framed IP Lease feature from AUTHD:

```
Pool p1 :
network: 10.1.1.0/24
address ranges:
  addr: 10.1.1.101 to 10.1.1.199
        (static host addr 10.1.1.122 excluded)
        (static host addr 10.1.1.111 excluded)
static host addresses:
  addr: 10.1.1.122      MAC addr: 0000.1111.2222
  addr: 10.1.1.111      MAC addr: 0000.cd38.05f9
                        Netmask : 255.255.255.0
                        Gateway  : 10.1.1.1
                        Lease    : 60 seconds
                        Added by AUTHD
lease <1:0:0:0>
subnet mask: 255.255.255.0 (pool's network mask)
Probe:
  Status:      Enabled      Default Values
  Type:        Ping         [Enabled]
  Packets:     5            [Ping]
  Timeout:     200 msec     [5]
  Timeout:     200 msec     [200]
Dynamic addresses:
  Total:       97
  Leased:      1
  Utilization: 1.0 %
Static host addresses:
  Total:       2
  Leased:      2
```

Parameters in the output of show ip dhcp pool

Parameter	Description
Pool	Name of the pool.
network	Subnet and mask length of the pool.
address ranges	Individual IP addresses and address ranges configured for the pool. The DHCP server can offer clients an IP address from within the specified ranges only. Any of these addresses that match an interface address on the device, or a static host address configured in the pool, will be automatically excluded from the range, and a message to this effect will appear beneath the range entry.
static host addresses	The static host addresses configured on the pool. Each IP address is permanently assigned to the client with the matching MAC address. Any of these addresses that match an interface address on the device will be automatically excluded, and a message to this effect will appear beneath the static host entry.
lease <days:hours:minutes>	The lease duration for address allocated by this pool.
domain	The domain name sent by the pool to clients. This is the domain name that the client should use when resolving host names using DNS.
subnet mask	The subnet mask sent by the pool to clients.
Probe - Status	Whether lease probing is enabled or disabled.
Probe - Type	The lease probe type configured. Either ping or ARP.
Probe - Packets	The number of packets sent for each lease probe in the range 0 to 10.
Probe - Timeout	The timeout value in milliseconds to wait for a response after each probe packet is sent. In the range 50 to 5000.
dns servers	The DNS server addresses sent to by the pool to clients.
default-router(s)	The default router addresses sent by the pool to clients.

Parameter	Description
user-defined options	The list of user-defined options sent by the pool to clients.
Dynamic addresses-Total	The total number of IP addresses that have been configured in the pool for dynamic allocation to DHCP clients.
Dynamic addresses-Leased	The number of IP addresses in the pool that have been dynamically allocated (leased) to DHCP clients.
Dynamic addresses - Utilization	The percentage of IP addresses in the pool that are currently dynamically allocated to clients.
Static host addresses-Total	The number of static IP addresses configured in the pool for specific DHCP client hosts.
Static host addresses - Leased	The number of static IP addresses assigned to specific DHCP client hosts.

Related commands

- ip dhcp pool**
- probe enable**
- probe packets**
- probe timeout**
- probe type**
- range**
- service dhcp-server**
- subnet-mask**

show ip dhcp-relay

Overview This command shows the configuration of the DHCP Relay Agent on each interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip dhcp-relay [interface <interface-name>]

Parameter	Description
<interface-name>	Name of a specific interface. This displays the DHCP configuration for the specified interface only.

Mode User Exec and Privileged Exec

Example To display the DHCP Relay Agent’s configuration on the interface vlan2, use the command:

```
awplus# show ip dhcp-relay interface vlan2
```

Output The following shows typical output.

Example output from the show ip dhcp-relay command

```
DHCP Relay Service is enabled
vlan2 is up, line protocol is up
Maximum hop count is 10
Maximum DHCP message length is 1400
DHCP Relay short lease time for IPv4 is 200 seconds
DHCP Relay short lease time for IPv6 are 2000/1900 (valid/
preferred) seconds
Insertion of Relay Agent Option is disabled
Checking of Relay Agent Option is disabled
The Remote Id string for Relay Agent Option is 0000.cd28.074c
Relay information policy is to append new relay agent
information
List of servers : 192.168.1.200
```

Related commands

- [ip dhcp-relay agent-option](#)
- [ip dhcp-relay agent-option checking](#)
- [ip dhcp-relay information policy](#)
- [ip dhcp-relay maxhops](#)
- [ip dhcp-relay server-address](#)

show ip dhcp server statistics

Overview This command shows statistics related to the DHCP server.

You can display the server counters using the **show counter dhcp-server** command as well as with this command.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ip dhcp server statistics

Mode User Exec and Privileged Exec

Example To display the server statistics, use the command:

```
awplus# show ip dhcp server statistics
```

Output The following shows typical output.

Example output from the show ip dhcp server statistics command

DHCP server counters	
DHCPDISCOVER in	20
DHCPREQUEST in	12
DHCPDECLINE in	1
DHCPRELEASE in	0
DHCPINFORM in	0
DHCPOFFER out	8
DHCPACK out	4
DHCPNAK out	0
BOOTREQUEST in	0
BOOTREPLY out	0
DHCPLEASEQUERY in	0
DHCPLEASEUNKNOWN out	0
DHCPLEASEACTIVE out	0
DHCPLEASEUNASSIGNED out	0

Parameter	Description
DHCPDISCOVER in	The number of Discover messages received by the DHCP server.
DHCPREQUEST in	The number of Request messages received by the DHCP server.
DHCPDECLINE in	The number of Decline messages received by the DHCP server.
DHCPRELEASE in	The number of Release messages received by the DHCP server.
DHCPINFORM in	The number of Inform messages received by the DHCP server.
DHCPOFFER out	The number of Offer messages sent by the DHCP server.
DHCPACK out	The number of Acknowledgement messages sent by the DHCP server.
DHCPNAK out	The number of Negative Acknowledgement messages sent by the DHCP server. The server sends these after receiving a request that it cannot fulfil because either there are no available IP addresses in the related address pool, or the request has come from a client that doesn't fit the network setting for an address pool.
BOOTREQUEST in	The number of bootp messages received by the DHCP server from bootp clients.

Parameter	Description
BOOTREPLY out	The number of bootp messages sent by the DHCP server to bootp clients.
DHCPLEASEQUERY in	The number of Lease Query messages received by the DHCP server from DHCP Relay Agents.
DHCPLEASEUNKNOWN out	The number of Lease Unknown messages sent by the DHCP server to DHCP Relay Agents.
DHCPLEASEACTIVE out	The number of Lease Active messages sent by the DHCP server to DHCP Relay Agents.
DHCPLEASEUNASSIGNED out	The number of Lease Unassigned messages sent by the DHCP server to DHCP Relay Agents.

Related commands [show counter dhcp-server](#)
[service dhcp-server](#)
[show ip dhcp binding](#)
[show ip dhcp pool](#)

show ip dhcp server summary

Overview This command shows the current configuration of the DHCP server. This includes:

- whether the DHCP server is enabled
- whether the DHCP server is configured to ignore BOOTP requests
- whether the DHCP server is configured to support DHCP lease queries
- the details of any user-defined options
- a list of the names of all DHCP address pools currently configured

This show command does not include any configuration details of the address pools. You can display these using the [show ip dhcp pool](#) command.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip dhcp server summary

Mode User Exec and Privileged Exec

Example To display the current configuration of the DHCP server, use the command:

```
awplus# show ip dhcp server summary
```

Output The following shows typical output.

Example output from the show ip dhcp server summary command

```
DHCP Server service is enabled
DHCP Server is running
BOOTP ignore is disabled
DHCP leasequery support is disabled
DHCP server is globally authoritative
DHCP subscriber-id substitution for client-id is not enabled
Pool list: p2
```

Related commands [ip dhcp leasequery enable](#)
[ip dhcp pool](#)
[service dhcp-server](#)

subnet-mask

Overview This command sets the subnet mask option for a DHCP address pool you are configuring. Use this command to specify the client's subnet mask as defined in RFC 950. This sets the subnet details using the pre-defined option 1. Note that if you create a user-defined option 1 using the **option** command, then you will override any settings created with this command. If you do not specify a subnet mask using this command, then the pool's network mask (specified using the **next-server** command) is applied.

The **no** variant of this command removes a subnet mask option from a DHCP pool. The pool reverts to using the pool's network mask.

Syntax subnet-mask <mask>
no subnet-mask

Parameter	Description
<mask>	Valid IPv4 subnet mask, in dotted decimal notation.

Mode DHCP Configuration

Examples To set the subnet mask option to 255 . 255 . 255 . 0 for DHCP pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# subnet-mask 255.255.255.0
```

To remove the subnet mask option from DHCP pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool P2
awplus(dhcp-config)# no subnet-mask
```

Related commands

- default-router**
- dns-server**
- domain-name**
- next-server**
- option**
- service dhcp-server**
- show ip dhcp pool**

use-subscriber-id

Overview Use this command to configure a DHCP server to use a subscriber identifier substitution for a client identifier on all DHCP packets for a given remote address pool.

Use the **no** variant of this command to remove the subscriber identifier substitution for a client identifier.

Syntax `use-subscriber-id`
`no use-subscriber-id`

Default Disabled

Mode DHCP Configuration

Usage notes If the subscriber identifier for the client identifier substitution is enabled for a remote pool, then all relayed packets destined for the pool must contain the relay agent information option. This includes the subscriber identifier sub-option.

If not, then the relayed packet will be silently ignored as the situation is considered as an invalid operation.

Example To set the subscriber-id and client-id substitution for the DHCP pool 'Campus-1', use the commands:

```
awplus# configure terminal
awplus(config)# ip dhcp pool Campus-1
awplus(dhcp-config)# use-subscriber-id
```

Output The following shows typical output.

Example output from show ip dhcp pool Campus-1

```
awplus#show ip dhcp pool Campus-1
Pool Campus-1 :
  subscriber-id substitution for client-id is enabled
  network: 192.168.2.0/24
  address ranges:
    addr: 192.168.2.50 to 192.168.2.100
  static host addresses:
    addr: 192.168.2.5      Client-id: office-pc-21
  lease <1:0:0:0>
  subnet mask: 255.255.255.0 (pool's network mask)
  dns servers: 192.168.2.2
  default-router(s): 192.168.2.2
  Probe:
    Status:      Enabled      [Enabled]
    Type:        Ping         [Ping]
    Packets:     5             [5]
    Timeout:     200 msecs    [200]
  Dynamic addresses:
    Total:       51
    Leased:      0
    Utilization: 0.0 %
  Static host addresses:
    Total:       1
    Leased:      1
```

Related commands **ip dhcp pool**
show ip dhcp pool

Command changes Version 5.5.2-0.1: command added

58

DHCP for IPv6 (DHCPv6) Commands

- Contents**
- **Introduction** on page 3138
 - **address prefix** on page 3139
 - **address range** on page 3141
 - **clear counter ipv6 dhcp-client** on page 3143
 - **clear counter ipv6 dhcp-server** on page 3144
 - **clear ipv6 dhcp binding** on page 3145
 - **clear ipv6 dhcp client** on page 3147
 - **dns-server (DHCPv6)** on page 3148
 - **domain-name (DHCPv6)** on page 3150
 - **ip dhcp-relay agent-option** on page 3151
 - **ip dhcp-relay agent-option subscriber-id-auto-mac** on page 3153
 - **ip dhcp-relay agent-option checking** on page 3154
 - **ip dhcp-relay agent-option remote-id** on page 3155
 - **ip dhcp-relay information policy** on page 3157
 - **ip dhcp-relay maxhops** on page 3159
 - **ip dhcp-relay max-message-length** on page 3160
 - **ip dhcp-relay server-address** on page 3162
 - **ip dhcp-relay short-lease-ipv6** on page 3164
 - **ipv6 address (DHCPv6 PD)** on page 3166
 - **ipv6 address dhcp** on page 3168
 - **ipv6 dhcp client pd** on page 3170
 - **ipv6 dhcp option** on page 3172
 - **ipv6 dhcp pool** on page 3175
 - **ipv6 dhcp server** on page 3177
 - **ipv6 local pool** on page 3179
 - **ipv6 nd prefix (DHCPv6)** on page 3181
 - **link-address** on page 3184
 - **option (DHCPv6)** on page 3186
 - **prefix-delegation pool** on page 3189
 - **service dhcp-relay** on page 3191
 - **show counter dhcp-relay** on page 3192
 - **show counter ipv6 dhcp-client** on page 3196
 - **show counter ipv6 dhcp-server** on page 3198
 - **show ip dhcp-relay** on page 3201
 - **show ipv6 dhcp** on page 3202
 - **show ipv6 dhcp binding** on page 3203
 - **show ipv6 dhcp interface** on page 3207

- **show ipv6 dhcp pool** on page 3209
- **sntp address** on page 3211

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure DHCPv6. For more information, see the [DHCPv6 Feature Overview and Configuration Guide](#).

DHCPv6 is a network protocol used to configure IPv6 hosts with IPv6 addresses and IPv6 prefixes for an IPv6 network. DHCPv6 is used instead of SLAAC (Stateless Address Autoconfiguration) at sites where centralized management of IPv6 hosts is needed. IPv6 routers require automatic configuration of IPv6 addresses and IPv6 prefixes.

DHCPv6 Prefix Delegation provides automatic configuration of IPv6 addresses and IPv6 prefixes.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

NOTE: *The IPv6 addresses shown use the address space 2001:0db8::/32, defined in RFC 3849 for documentation purposes. These addresses should not be used for practical networks (other than for testing purposes) nor should they appear on any public network.*

address prefix

Overview Use this command in DHCPv6 Configuration mode to specify an address prefix for address assignment with DHCPv6 server pool configuration.

Use the **no** variant of this command to remove the address prefix from the DHCPv6 server pool.

Syntax address prefix <ipv6-prefix/prefix-length> [lifetime {<valid-time>|infinite} {<preferred-time>|infinite}]
no address prefix <ipv6-prefix/prefix-length>

Parameter	Description
<ipv6-prefix/prefix-length>	Specify an IPv6 prefix and prefix length. The prefix length indicates the length of the IPv6 prefix assigned to the pool. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
lifetime	Specify a time period for the hosts to remember router advertisements (RAs). If you specify the optional lifetime parameter with this command then you must also specify a <i>valid-time</i> and a <i>preferred-time</i> value. See the Usage notes below this parameter table for a description of preferred and valid lifetimes and how these determine deprecated or invalid IPv6 addresses upon expiry.
<valid-time>	Specify a valid lifetime in seconds in the range <5-315360000>. The default valid lifetime is 2592000 seconds.
infinite	Specify an infinite valid lifetime or an infinite preferred lifetime, or both, when using this keyword.
<preferred-time>	Specify a preferred lifetime in seconds in the range <5-315360000>. The default preferred lifetime is 604800 seconds.

Mode DHCPv6 Configuration

Default The default valid lifetime is 2592000 seconds and the default preferred lifetime is 604800 seconds.

Usage notes This command creates a pool of prefixes from which addresses are assigned to clients on request, and allocates a network prefix from which the DHCPv6 Server leases addresses. This command is an alternative to using a range set using the **address range** command.

The DHCPv6 Server selects an IPv6 address from the range available allocated by the IPv6 prefix, randomly generating the suffix of the IPv6 address, with the specified preferred and valid lifetime leases. Leased IPv6 address are found in the DHCPv6 Server REPLY packet, which is located within the IANA (Identity Association for Non-temporary Addresses) IA address field in the **REPLY** message.

Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires.

Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected.

An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.

Examples To add IPv6 address prefix 2001:0db8:1::/48 for DHCPv6 server pool configuration, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool pool1
awplus(config-dhcp6)# address prefix 2001:0db8:1::/48
```

To remove a configured IPv6 address prefix for DHCPv6 server pool configuration, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool pool1
awplus(config-dhcp6)# no address prefix 2001:0db8:1::/48
```

Related commands **address range**
ipv6 dhcp pool

Validation Commands **show ipv6 dhcp binding**
show ipv6 dhcp pool

address range

Overview Use this command in DHCPv6 Configuration mode to specify an address range for address assignment with DHCPv6 server pool configuration.

Use the **no** variant of this command to remove an address range from the DHCPv6 server pool.

Syntax address range <first-ipv6-address> <last-ipv6-address>[lifetime {<valid-time>|infinite} {<preferred-time>|infinite}]]
no address range <first-ipv6-address> <last-ipv6-address>

Parameter	Description
<first-ipv6-address>	Specify the first IPv6 address of the IPv6 address range, in hexadecimal notation in the format X:X::X:X.
<last-ipv6-address>	Specify the last IPv6 address of the IPv6 address range, in hexadecimal notation in the format X:X::X:X.
lifetime	Optional. Specify a time period for the hosts to remember router advertisements (RAs). If you specify this parameter then you must also specify a <i>valid-time</i> and a <i>preferred-time</i> value. See the Usage notes below this parameter table for a description of preferred and valid lifetimes and how these determine deprecated or invalid IPv6 addresses upon expiry.
<valid-time>	Specify a valid lifetime in seconds in the range <5-31536000>. The default valid lifetime is 2592000 seconds.
infinite	Specify an infinite valid lifetime or an infinite preferred lifetime, or both, when using this keyword.
<preferred-time>	Specify a preferred lifetime in seconds in the range <5-31536000>. The default preferred lifetime is 604800 seconds.

Default The default valid lifetime is 2592000 seconds and the default preferred lifetime is 604800 seconds.

Mode DHCPv6 Configuration

Usage Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires.

Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected.

An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.

Examples To add the IPv6 address range 2001:0db8:1::1 to 2001:0db8:1fff::1 for DHCPv6 server pool configuration, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool pool1
awplus(config-dhcp6)# address range 2001:0db8:1::1
2001:0db8:1fff::1
```

To remove a configured IPv6 address range for DHCPv6 server pool configuration, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool pool1
awplus(config-dhcp6)# no address range
```

Related commands [address prefix](#)
[ipv6 dhcp pool](#)

Validation Commands [show ipv6 dhcp binding](#)
[show ipv6 dhcp pool](#)

clear counter ipv6 dhcp-client

Overview Use this command in Privileged Exec mode to clear DHCPv6 client counters.

Syntax clear counter ipv6 dhcp-client

Mode Privileged Exec

Example To clear DHCPv6 client counters, use the following command:

```
awplus# clear counter ipv6 dhcp-client
```

Related commands [show counter ipv6 dhcp-client](#)

clear counter ipv6 dhcp-server

Overview Use this command in Privileged Exec mode to clear DHCPv6 server counters.

Syntax clear counter ipv6 dhcp-server

Mode Privileged Exec

Example To clear DHCPv6 server counters, use the following command:
awplus# clear counter ipv6 dhcp-server

Related commands [show counter ipv6 dhcp-server](#)

clear ipv6 dhcp binding

Overview Use this command in Privileged Exec mode to clear either a specific lease binding or the lease bindings as specified by the command parameters. The command will only take effect on dynamically allocated bindings, not statically configured bindings. This command clears binding entries on the DHCPv6 server binding table.

Syntax `clear ipv6 dhcp binding {ipv6 <prefix>|duid <DUID>|all|pool <name>}`

Parameter	Description
ipv6 <prefix>	Optional. Specify the IPv6 prefix of the DHCPv6 client, in hexadecimal notation in the format X:X::X:X.
duid <DUID>	Specify the DUID (DHCPv6 unique ID) of the DHCPv6 client.
all	All DHCPv6 bindings.
pool <name>	Description used to identify DHCPv6 server address pool. Valid characters are any printable character. If the name contains spaces then you must enclose these in "quotation marks".

Mode Privileged Exec

Usage notes A specific binding may be deleted by **ipv6** address or **duid** address, or several bindings may be deleted at once using **all** or **pool**.

Note that if you specify to clear the **ipv6** or **duid** address of what is actually a static DHCPv6 binding, an error message is displayed. If **all** or **pool** are specified and one or more static DHCPv6 bindings exist within those addresses, any dynamic entries within those addresses are cleared but any static entries are not cleared.

The clear ipv6 dhcp binding command is used as a server function. A binding table entry on the DHCPv6 server is automatically:

- Created whenever a prefix is delegated to a client from the configuration pool.
- Updated when the client renews, rebinds, or confirms the prefix delegation.
- Deleted when the client releases all the prefixes in the binding, all prefix lifetimes have expired, or when a user runs the clear ipv6 dhcp binding command.

If the **clear ipv6 dhcp binding** command is used with the optional IPv6 address parameter, only the binding for the specified client is deleted. If the **clear ipv6 dhcp binding** command is used without the optional IPv6 address parameter, then all automatic client bindings are deleted from the DHCPv6 bindings table.

Example To clear all dynamic DHCPv6 server binding entries, use the command:
`awplus# clear ipv6 dhcp binding all`

Output The following shows typical output.

Example output from the clear ipv6 dhcp binding all command

```
awplus#clear ipv6 dhcp binding all
% Deleted 1 entries
```

Related commands [show ipv6 dhcp binding](#)

clear ipv6 dhcp client

Overview Use this command in Privileged Exec mode to restart a DHCPv6 client on an interface.

Syntax `clear ipv6 dhcp client <interface>`

Parameter	Description
<interface>	Specify the interface name to restart a DHCPv6 client on.

Mode Privileged Exec

Example To restart a DHCPv6 client on interface vlan1, use the following command:

```
awplus# clear ipv6 dhcp client vlan1
```

Related commands [show ipv6 dhcp binding](#)

dns-server (DHCPv6)

Overview Use this command to add a Domain Name System (DNS) server to the DHCPv6 address pool you are configuring. You can use this command multiple times to create a list of DNS name servers available to the client. This sets the DNS server details using the pre-defined option 6. Note that if you add a user-defined option 6 using the **option (DHCPv6)**, then you will override any settings created with this command.

Use the **no** variant of this command to remove either the specified DNS server or all DNS servers from the DHCPv6 pool.

Syntax `dns-server <ipv6-address>`
`no dns-server [<ipv6-address>]`

Parameter	Description
<code><ipv6-address></code>	Specify an IPv6 address of the DNS server, in hexadecimal notation in the format X:X::X:X. This parameter is required when adding a DNS server to the DHCPv6 address pool. All DNS servers are removed from the DHCPv6 pool if you enter the <code>no dns-server</code> command without this parameter.

Mode DHCPv6 Configuration

Examples To add the DNS server with the assigned IPv6 address 2001:0db8:3000:3000::32 to the DHCPv6 server pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(dhcpv6-config)# dns-server 2001:0db8:3000:3000::32
```

To remove the DNS server with the assigned IPv6 address 2001:0db8:3000:3000::32 from the DHCPv6 server pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(dhcpv6-config)# no dns-server 2001:0db8:3000:3000::32
```

To remove all DNS servers from the DHCPv6 server pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(dhcpv6-config)# no dns-server
```


Related commands **ipv6 dhcp pool**
option (DHCPv6)
show ipv6 dhcp pool

domain-name (DHCPv6)

Overview Use this command in DHCPv6 Configuration mode to add a domain name to the DHCPv6 server address pool you are configuring.

Use the **no** variant of this command to remove a domain name from the address pool.

Syntax domain-name <domain-name>
no domain-name

Parameter	Description
<domain-name>	Specify the domain name you wish to assign the DHCPv6 server address pool. Valid characters are printable characters. If the name contains spaces then you must enclose it in "quotation marks".

Mode DHCPv6 Configuration

Usage This command specifies the domain name that a client should use when resolving host names using the Domain Name System, and sets the domain name details using the pre-defined option 15. Note that if you add a user-defined option 15 using the **option (DHCPv6)**, then you will override any settings created with this command.

Examples To add the domain name Engineering to DHCPv6 server pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(dhcpv6-config)# domain-name Engineering
```

To remove the domain name Engineering from DHCPv6 server pool P2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(dhcpv6-config)# no domain-name Engineering
```

Related commands **dns-server (DHCPv6)**
option (DHCPv6)
show ipv6 dhcp pool

ip dhcp-relay agent-option

Overview This command enables the DHCP Relay Agent to insert the DHCP Relay Agent Information Option (Option 82) into the client-request packets that it relays to its DHCP server. This allows the DHCP Relay Agent to pass on information to the server about the network location of the client device. The DHCP Relay Agent strips the DHCP Relay Agent Option 82 field out of the DHCP server's response, so that the DHCP client never sees this field.

When the DHCP Relay Agent appends its DHCP Relay Agent Option 82 data into the packet, it first overwrites any pad options present; then if necessary, it increases the packet length to accommodate the DHCP Relay Agent Option 82 data.

The **no** variant of this command stops the DHCP Relay Agent from appending the Option 82 field onto DHCP requests before forwarding it to the server.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

NOTE: *ip dhcp-relay agent-optionip dhcp-relay information policy*

Syntax ip dhcp-relay agent-option
no ip dhcp-relay agent-option

Default DHCP Relay Agent Information Option (Option 82) insertion is disabled by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes Use this command to alter the DHCP Relay Agent Option 82 setting when your device is the first hop for the DHCP client. To limit the maximum length of the packet, use the [ip dhcp-relay max-message-length](#) command.

This command cannot be enabled if DHCP snooping is enabled on your device ([service dhcp-snooping](#)), and vice versa.

Examples To make the DHCP Relay Agent listening on vlan2 append the DHCP Relay Agent Option 82 field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option
```

To stop the DHCP Relay Agent from appending the DHCP Relay Agent Option 82 field on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option
```

Related commands [**ip dhcp-relay agent-option remote-id**](#)
[**ip dhcp-relay information policy**](#)
[**ip dhcp-relay max-message-length**](#)
[**service dhcp-relay**](#)

ip dhcp-relay agent-option subscriber-id-auto-mac

Overview This command causes the relay agent to insert the requesting clients' MAC address into a subscriber ID field in the relay header. A suitably-configured server can then use this subscriber ID option to assign the same IPv6 address to that requesting client every time it requires an address.

Use the no form of this command to disable this feature.

Syntax `ip dhcp-relay agent-option subscriber-id-auto-mac`
`no ip dhcp-relay agent-option subscriber-id-auto-mac`

Default Disabled

Usage notes By default, DHCPv6 uses a DUID-LLT client identifier instead of a MAC address. This is generated by the operating system when DHCP first starts. If the OS is reinstalled the DUID-LLT can change, and any multiple operating systems on the machine will all have different DUIDs.

Configuring the subscriber-id-auto-mac option causes the relay agent to insert the requesting client's MAC address into a subscriber ID field in the relay header. A suitably-configured server can then use this subscriber ID to assign the same IPv6 address to that requesting client every time it connects.

The client must be in the same L2 network as the relay. If there are multiple relays between the client and the server, only the first relay will add a subscriber ID option.

Example To enable this feature on VLAN1, use the following commands:

```
awplus(config)#int vlan1
awplus(config-if)#ip dhcp-relay agent-option subscriber-id-auto-mac
```

For an example of how to configure a relay agent and server, see the document "How to use DHCPv6 to assign specific IPv6 addresses to specific devices", available from www.alliedtelesis.com.

ip dhcp-relay agent-option checking

Overview This command enables the DHCP Relay Agent to check DHCP Relay Agent Information Option (Option 82) information in response packets returned from DHCP servers. If the information does not match the information it has for its own client (downstream) interface then the DHCP Relay Agent drops the packet. Note that **ip dhcp-relay agent-option** must be configured.

The DHCP Relay Agent Option 82 field is included in relayed client DHCP packets if:

- DHCP Relay Agent Option 82 is enabled (**ip dhcp-relay agent-option**), and
- DHCP Relay Agent is enabled on the device (**service dhcp-relay**)

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the **DHCP Feature Overview and Configuration Guide**.

Syntax ip dhcp-relay agent-option checking
no ip dhcp-relay agent-option checking

Mode Interface Configuration for VLAN interfaces.

Examples To make the DHCP Relay Agent listening on vlan2 check the DHCP Relay Agent Information Option (Option 82) field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option
awplus(config-if)# ip dhcp-relay agent-option checking
```

To stop the DHCP Relay Agent on vlan2 from checking the DHCP Relay Agent Information Option (Option 82) field, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option checking
```

Related commands **ip dhcp-relay agent-option**
ip dhcp-relay agent-option remote-id
ip dhcp-relay information policy
service dhcp-relay

ip dhcp-relay agent-option remote-id

Overview Use this command to specify the Remote ID sub-option of the DHCP Relay Agent Option 82 field the DHCP Relay Agent inserts into clients' request packets. The Remote ID identifies the device that is inserting the DHCP Relay Agent Option 82 information. If a Remote ID is not specified, the Remote ID sub-option is set to the device's MAC address.

Use the **no** variant of this command to return the Remote ID for an interface.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax ip dhcp-relay agent-option remote-id *<remote-id>*
no ip dhcp-relay agent-option remote-id

Parameter	Description
<i><remote-id></i>	An alphanumeric (ASCII) string, 1 to 63 characters in length. Additional characters allowed are hyphen (-), underscore (_), and hash (#). Spaces are not allowed.

Default The Remote ID is set to the device's MAC address by default.

Mode Interface Configuration for VLAN interfaces.

Usage notes The Remote ID sub-option is included in the DHCP Relay Agent Option 82 field of relayed client DHCP packets if:

- DHCP Relay Agent Option 82 is enabled ([ip dhcp-relay agent-option](#)), and
- DHCP Relay Agent is enabled on the device ([service dhcp-relay](#))

Examples To set the Remote ID to myid for client DHCP packets received on vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay agent-option remote-id myid
```

To remove the Remote ID specified for vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay agent-option remote-id
```

Related commands [ip dhcp-relay agent-option](#)
[ip dhcp-relay agent-option checking](#)
[show ip dhcp-relay](#)

ip dhcp-relay information policy

Overview This command sets the policy for how the DHCP relay deals with packets arriving from the client that contain DHCP Relay Agent Option 82 information.

If the command **ip dhcp-relay agent-option** has not been configured, then this command has no effect at all - no alteration is made to Option 82 information in packets arriving from the client side.

However, if the command **ip dhcp-relay agent-option** has been configured, this command modifies how the DHCP relay service deals with cases where the packet arriving from the client side already contains DHCP Relay Agent Option 82 information.

This command sets the action that the DHCP relay should take when a received DHCP client request contains DHCP Relay Agent Option 82 information.

By default, the DHCP Relay Agent replaces any existing DHCP Relay Agent Option 82 field with its own DHCP Relay Agent field. This is equivalent to the functionality of the **replace** parameter.

The **no** variant of this command returns the policy to the default behavior - i.e. replacing the existing DHCP Relay Agent Option 82 field.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

NOTE: *ip dhcp-relay agent-optionip dhcp-relay information policy*

Syntax ip dhcp-relay information policy {append|drop|keep|replace}
no ip dhcp-relay information policy

Parameter	Description
append	The DHCP Relay Agent appends the DHCP Relay Agent Option 82 field of the packet with its own DHCP Relay Agent Option 82 details.
drop	The DHCP Relay Agent discards the packet.
keep	The DHCP Relay Agent forwards the packet without altering the DHCP Relay Agent Option 82 field.
replace	The DHCP Relay Agent replaces the existing DHCP Relay Agent details in the DHCP Relay Agent Option 82 field with its own details before forwarding the packet.

Mode Interface Configuration for VLAN interfaces.

Examples To make the DHCP Relay Agent listening on vlan2 drop any client requests that already contain DHCP Relay Agent Option 82 information, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay information policy drop
```

To reset the DHCP relay information policy to the default policy for interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay information policy
```

Related commands [ip dhcp-relay agent-option](#)
[ip dhcp-relay agent-option checking](#)
[service dhcp-server](#)

ip dhcp-relay maxhops

Overview This command sets the hop count threshold for discarding BOOTP messages. When the hops field in a BOOTP message exceeds the threshold, the DHCP Relay Agent discards the BOOTP message. The hop count threshold is set to 10 hops by default.

Use the **no** variant of this command to reset the hop count to the default.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay maxhops <1-255>`
`no ip dhcp-relay maxhops`

Parameter	Description
<code><1-255></code>	The maximum hop count value.

Default The default hop count threshold is 10 hops.

Mode Interface Configuration for VLAN interfaces.

Example To set the maximum number of hops to 5 for packets received on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay maxhops 5
```

Related commands [service dhcp-relay](#)

ip dhcp-relay max-message-length

Overview This command applies when the device is acting as a DHCP Relay Agent and DHCP Relay Agent Option 82 insertion is enabled. It sets the maximum DHCP message length (in bytes) for the DHCP packet with its DHCP Relay Agent Option 82 data inserted. From this value it calculates the maximum packet size that it will accept at its input. Packets that arrive greater than this value will be dropped.

The **no** variant of this command sets the maximum message length to its default of 1400 bytes.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay max-message-length <548-1472>`
`no ip dhcp-relay max-message-length`

Parameter	Description
<548-1472>	The maximum DHCP message length (this is the message header plus the inserted DHCP option fields in bytes).

Default The default is 1400 bytes.

Mode Interface Configuration for VLAN interfaces.

Usage notes When a DHCP Relay Agent (that has DHCP Relay Agent Option 82 insertion enabled) receives a request packet from a DHCP client, it will append the DHCP Relay Agent Option 82 component data, and forward the packet to the DHCP server. The DHCP client will sometimes issue packets containing pad option fields that can be overwritten with Option 82 data.

Where there are insufficient pad option fields to contain all the DHCP Relay Agent Option 82 data, the DHCP Relay Agent will increase the packet size to accommodate the DHCP Relay Agent Option 82 data. If the new (increased) packet size exceeds that defined by the **maximum-message-length** parameter, then the DHCP Relay Agent will drop the packet.

NOTE: [ip dhcp-relay agent-option](#)

Example To set the maximum DHCP message length to 1200 bytes for packets arriving in interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay max-message-length 1200
```

To reset the maximum DHCP message length to the default of 1400 bytes for packets arriving in interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay max-message-length
```

Related commands [service dhcp-relay](#)

ip dhcp-relay server-address

Overview

This command adds a DHCP server for the DHCP Relay Agent to forward client DHCP packets to on a particular interface. You can add up to five DHCP servers on each device interface that the DHCP Relay Agent is listening on.

The **no** variant of this command deletes the specified DHCP server from the list of servers available to the DHCP relay agent.

The **no ip dhcp-relay** command removes all DHCP relay settings from the interface.

For DHCP Relay Agent and DHCP Relay Agent Option 82 introductory information, see the [DHCP Feature Overview and Configuration Guide](#).

Syntax `ip dhcp-relay server-address {<ipv4-address>|<ipv6-address> <server-interface>}`
`no ip dhcp-relay server-address {<ipv4-address>|<ipv6-address> <server-interface>}`
`no ip dhcp-relay`

Parameter	Description
<i><ipv4-address></i>	Specify the IPv4 address of the DHCP server for the DHCP Relay Agent to forward client DHCP packets to, in dotted decimal notation. The IPv4 address uses the format A.B.C.D.
<i><ipv6-address></i>	Specify the IPv6 address of the DHCPv6 server for the DHCPv6 Relay Agent to forward client DHCP packets to, in hexadecimal notation.
<i><server-interface></i>	Specify the interface name of the DHCPv6 server. It is only required for a DHCPv6 server with an IPv6 address.

Mode Interface Configuration for VLAN interfaces.

Usage notes For a DHCP server with an IPv6 address you must specify the interface for the DHCP server. See examples below for configuration differences between IPv4 and IPv6 DHCP relay servers.

See also the [service dhcp-relay](#) command to enable the DHCP Relay Agent on your device. The [ip dhcp-relay server-address](#) command defines a relay destination on an interface on the device, needed by the DHCP Relay Agent to relay DHCP client packets to a DHCP server.

Examples: To enable the DHCP Relay Agent to relay DHCP packets on interface vlan2 to the DHCP server with the IPv4 address 192.0.2.200, use the commands:

DHCP for IPv4

```
awplus# configure terminal
awplus(config)# service dhcp-relay
awplus(config)# interface vlan2
awplus(config-if)# ip dhcp-relay server-address 192.0.2.200
```

To remove the DHCP server with the IPv4 address 192.0.2.200 from the list of servers available to the DHCP Relay Agent on interface vlan2, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay server-address 192.0.2.200
```

Examples: To enable the DHCP Relay Agent on your device to relay DHCP packets on interface vlan10 to the DHCP server with the IPv6 address 2001:0db8:010d::1 on interface vlan20, use the commands:

DHCPv6

```
awplus# configure terminal
awplus(config)# service dhcp-relay
awplus(config)# interface vlan10
awplus(config-if)# ip dhcp-relay server-address
2001:0db8:010d::1 vlan20
```

To remove the DHCP server with the IPv6 address 2001:0db8:010d::1 on interface vlan20 from the list of servers available to the DHCP Relay Agent on interface vlan10, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan10
awplus(config-if)# no ip dhcp-relay server-address
2001:0db8:010d::1 vlan20
```

Example: To disable DHCP relay on vlan2, use the commands:

disabling DHCP relay

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ip dhcp-relay
```

Related commands [service dhcp-relay](#)

ip dhcp-relay short-lease-ipv6

Overview Use this command to reduce the amount of time an IPv6 address is assigned to a client device.

Long lease times can cause issues in dynamic networks where client devices frequently move between segments, such as VLANs. These device may retain an outdated IP address from its previous VLAN, disrupting communication.

This command is particularly useful in networks with a high turnover of devices or in environments where IP addresses are scarce.

Use the **no** variant of this command to remove the short lease time configuration.

Syntax `ip dhcp-relay short-lease-ipv6 [<20-3600> <20-3600>]`
`no ip dhcp-relay short-lease-ipv6`

Parameter	Description
<20-3600>	The valid lease time for IPv6 DHCP relay in seconds.
<20-3600>	The preferred lease time for IPv6 DHCP relay in seconds.

Default Not set

Mode Interface Configuration

Usage notes The preferred lease time (the second parameter) must be less than the valid lease time (the first parameter).

- **Preferred lease time:** Indicates when preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires.
- **Valid lease time:** Indicates when IPv6 addresses or prefixes must be abandoned. An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires.

Example To configure a DHCP Relay on interface vlan1 with a valid lease time of 2000 seconds, and a preferred lease time of 1000 seconds for IPv6, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan1
awplus(config-if)# ip dhcp-relay short-lease-ipv6 2000 1000
```

Related commands [show ip dhcp-relay](#)

Command changes Version 5.5.4-2.1: command added

ipv6 address (DHCPv6 PD)

Overview Use this command to append an IPv6 address suffix to the IPv6 prefix provided by a DHCPv6 Prefix Delegation (PD) server.

Use the **no** variant of this command to remove the IPv6 address assigned and disable IPv6. Note that if no global addresses are left after removing the IPv6 address then IPv6 is disabled.

Syntax `ipv6 address [<ipv6-prefix-name>] <ipv6-addr/prefix-length> [eui64]`
`no ipv6 address [<ipv6-prefix-name>] <ipv6-addr/prefix-length> [eui64]`

Parameter	Description
<code><ipv6-prefix-name></code>	The IPv6 prefix name advertised on the router advertisement message sent from the device. The IPv6 prefix name is delegated from the DHCPv6 Server configured for DHCPv6 Prefix-Delegation.
<code><ipv6-addr/prefix-length></code>	Specifies the IPv6 address to be set, for example ::1/ 64. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<code>eui64</code>	EUI-64 is a method of automatically deriving the lower 64 bits of an IPv6 address, based on the switch's MAC address.

Mode Interface Configuration for VLAN interfaces.

Usage notes When specifying the **eui64** parameter, the interface identifier of the IPv6 address is derived from the MAC address of the device.

For more information about EUI64, see the [IPv6 Feature Overview and Configuration Guide](#).

Examples To assign the IPv6 address 2001:0db8::a2/48 to the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 address 2001:0db8::a2/48
```

To remove the IPv6 address 2001:0db8::a2/48 from the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 address 2001:0db8::a2/48
```

To assign the **eui64** derived address in the prefix 2001:0db8::/64 to VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 address 2001:0db8::/64 eui64
```

To remove the **eui64** derived address in the prefix 2001:0db8::/64 from VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 address 2001:0db8::/64 eui64
```

To configure a PD prefix named 'prefix1' on interface vlan2 and then add an IPv6 address, use the following commands. In this example, the prefix will be assigned from the pool on the PD client. The host portion or suffix will be ::1 for the last 64 bits:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 dhcp client pd prefix1
awplus(config-if)# ipv6 address prefix1::1/64
```

Related commands

- [ipv6 dhcp client pd](#)
- [ipv6 dhcp pool](#)
- [ipv6 local pool](#)
- [ipv6 nd prefix \(DHCPv6\)](#)
- [prefix-delegation pool](#)
- [show ipv6 dhcp binding](#)
- [show ipv6 interface](#)
- [show ipv6 route](#)
- [show running-config](#)

ipv6 address dhcp

Overview Use this command to activate the DHCPv6 client on the interface that you are configuring. This allows the interface to use the DHCPv6 client to obtain its IPv6 configuration details from a DHCPv6 server on its connected network.

The command also enables IPv6 on the interface, which creates an EUI-64 link-local address as well as enabling RA processing and SLAAC.

Use the **no** variant of this command to stop the interface from obtaining IPv6 configuration details from a DHCPv6 server.

The DHCPv6 client supports the following IP configuration options:

- Option 1—the subnet mask for your device.
- Option 3—a list of default routers.
- Option 6—a list of DNS servers. This list appends the DNS servers set on your device with the **dns-server (DHCPv6)** command.
- Option 15—a domain name used to resolve host names. This option replaces any domain name that you have set with the **domain-name (DHCPv6)** command.
- Option 51—lease expiration time.

Syntax `ipv6 address dhcp [default-route-to-server]`
`no ipv6 address dhcp`

Parameter	Description
default-route-to-server	Allow the automatic configuration of a default route to the DHCPv6 server. This option is not enabled by default when you enable the DHCP client on an interface.

Mode Interface Configuration for VLAN interfaces.

Usage notes Use the **default-route-to-server** option to allow the automatic configuration of a default route to the DHCPv6 server. Note that this option is not enabled by default when you enable the DHCP client on an interface.

Examples To set the interface vlan2 to use DHCPv6 to obtain an IPv6 address, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 address dhcp
```

To stop the interface vlan2 from using DHCPv6 to obtain its IPv6 address, use the commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 address dhcp
```

Related commands

- clear ipv6 dhcp client**
- ipv6 address**
- ipv6 address (DHCPv6 PD)**
- show ipv6 dhcp interface**
- show running-config**

ipv6 dhcp client pd

Overview Use this command in Interface Configuration mode to enable the DHCPv6 client process and enable requests for prefix delegation through the interface that you are configuring.

Use the **no** variant of this command to disable requests for prefix delegation. This is the default setting.

For further information about DHCPv6 Prefix Delegation, which is used to automate the process of assigning prefixes, see the [DHCPv6 Feature Overview and Configuration Guide](#).

Syntax `ipv6 dhcp client pd <prefix-name> <default-route-to-server>`
`no ipv6 dhcp client pd`

Parameter	Description
<code><prefix-name></code>	Specify an IPv6 general prefix name. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".
<code><default-route-to-server></code>	Specify the default route to the DHCP server

Mode Interface Configuration for VLAN interfaces.

Default Prefix delegation is disabled by default on an interface.

Usage notes Entering the **ipv6 dhcp client pd** command starts the DHCPv6 client process if not already running, and enables requests for prefix delegation through the interface on which the command is configured.

When prefix delegation is enabled and a prefix is acquired, the prefix is stored in the IPv6 prefix pool with an internal name defined by the required `<prefix-name>` placeholder parameter. The [ipv6 address](#) command can then refer to the prefixes stored in the IPv6 prefix pool.

Examples To enable prefix delegation with the prefix name my-prefix-name on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 dhcp client pd my-prefix-name
```

To disable prefix delegation on the VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 dhcp client pd
```

Related commands

- ipv6 enable**
- clear ipv6 dhcp client**
- ipv6 address (DHCPv6 PD)**
- ipv6 nd prefix (DHCPv6)**
- show ipv6 dhcp binding**
- show ipv6 dhcp interface**

ipv6 dhcp option

Overview Use this command in Global Configuration mode to create a user-defined DHCPv6 option. You can then use this option when configuring a DHCPv6 server address pool, by using the **option (DHCPv6)** command.

Options with the same number as one of the pre-defined options override the standard option definition. The pre-defined options use the option numbers 1, 3, 6, 15, and 51.

Use the **no** variant of this command to remove either the specified user-defined option. This also removes user-defined options from the associated DHCPv6 server address pools.

Syntax `ipv6 dhcp option <1-254> [name <option-name>] [<option-type>]`
`no ipv6 dhcp option <1-254>|<option-name>`

Parameter	Description
<1-254>	The option number of the option. Options with the same number as one of the standard options overrides the standard option definition.
<option-name>	Option name used to identify the option. You cannot use a number as the option name. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks". Default: no default
<option-type>	The option value. You must specify a value that is appropriate to the option type:
ascii	An ASCII text string
hex	A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long.
ipv6	An IPv6 address or prefix that has hexadecimal notation in the format HHHH:HHHH: :HHHH:HHHH. To create a list of IPv6 addresses, you must add each IPv6 address individually by using the option command multiple times.
integer	A number from 0 to 4294967295.
flag	A value that either sets (to 1) or unsets (to 0) a flag: true, on, or enabled will set the flag. false, off or disabled will unset the flag.

Mode Global Configuration

Examples To define a user-defined ASCII string option as option 66, without a name, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp option 66 ascii
```

To define a user-defined hexadecimal string option as option 46, with the name "tcpip- node-type", use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp option 46 name tcpip-node-type hex
```

To define a user-defined IP address option as option 175, with the name special-address, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp option 175 name special-address ip
```

To remove the specific user-defined option with the option number 12, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 dhcp option 12
```

To remove the specific user-defined option with the option name perform-router-discovery, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 dhcp option perform-router-discovery
```

Related commands

- dns-server (DHCPv6)**
- domain-name (DHCPv6)**
- option (DHCPv6)**
- show ipv6 dhcp**

ipv6 dhcp pool

Overview Use this command in Global Configuration mode to enter the DHCPv6 Configuration mode for the DHCPv6 server pool name as specified in the required command parameter. If the name specified is not associated with an existing pool, the device will create a new pool with this name, then enter the configuration mode for the new pool.

Once you have entered the DHCPv6 configuration mode, all commands executed before the next **exit** command will apply to this pool.

You can create multiple DHCPv6 server pools on devices with multiple interfaces. This allows the device to act as a DHCPv6 server on multiple interfaces to distribute different information to clients on the different networks.

Use the **no** variant of this command to delete the specific DHCPv6 pool.

Syntax `ipv6 dhcp pool <DHCPv6-poolname>`
`no ipv6 dhcp pool <DHCPv6-poolname>`

Parameter	Description
<code><DHCPv6-poolname></code>	Description used to identify this DHCPv6 server pool. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".

Mode Global Configuration

Usage All DHCPv6 prefix pool names must be unique. IPv6 prefix pools have a similar function to IPv4 address pools. Contrary to IPv4, a block of IPv6 addresses (an IPv6 address prefix) are assigned and not single IPv6 addresses. IPv6 prefix pools are not allowed to overlap.

Once a pool is configured, it cannot be changed. To change the configuration, you must remove then recreate a IPv6 prefix pool. All IPv6 prefixes already allocated are also freed.

Examples To create the DHCPv6 pool named P2 and enter DHCPv6 configuration mode, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)#
```

To delete the DHCPv6 pool named P2, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 dhcp pool P2
```

Related commands

- ipv6 local pool**
- option (DHCPv6)**
- prefix-delegation pool**
- show ipv6 dhcp binding**
- show ipv6 dhcp pool**

ipv6 dhcp server

Overview Use this command in Interface Configuration mode to enable DHCPv6 server for the current IPv6 configured interface to use the specified DHCPv6 server pool name.

The DHCPv6 server service listens for DHCPv6 requests on the IPv6 configured interface. The DHCPv6 server service does not run on interfaces without IPv6 configured on them.

Use the **no** variant of this command to disable the DHCPv6 server.

Syntax `ipv6 dhcp-server [<DHCPv6-poolname>]`
`no ipv6 dhcp-server`

Parameter	Description
<DHCPv6-poolname>	Specify a named DHCPv6 server pool as defined with the ipv6 dhcp pool command. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".

Mode Interface Configuration for VLAN interfaces.

Usage notes The **ipv6 dhcp server** command enables the DHCPv6 service on a specified interface using the pool for prefix delegation and configuration through the specified interface.

Note that DHCPv6 client, DHCPv6 server and DHCPv6 relay are mutually exclusive on an interface. When one of the DHCPv6 functions is enabled on an interface then another DHCPv6 function cannot be enabled on the same interface.

Examples To enable the DHCPv6 server service and use the DHCPv6 pool named P2 on VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 dhcp server P2
```

To disable the DHCPv6 server on VLAN interface vlan2, use the following commands:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 dhcp server
```

Related **ipv6 dhcp pool**
commands **show ipv6 dhcp binding**
show ipv6 dhcp pool

ipv6 local pool

Overview Use this command in Global Configuration mode to configure a local DHCPv6 server prefix delegation pool specifying a poolname and a prefix/prefix length. You can optionally exclude the locally assigned prefix from the pool with the **exclude-local-prefix** keyword.

Use the **no** variant of this command to remove a local DHCPv6 server prefix delegation pool specifying the poolname.

Syntax `ipv6 local pool <DHCPv6-poolname> <delegated-prefix-name> <ipv6-prefix/prefix-length> <assigned-length> [exclude-local-prefix]`
`no ipv6 local pool`

Parameter	Description
<code><DHCPv6-poolname></code>	Description used to identify this DHCPv6 server pool. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".
<code><delegated-prefix-name></code>	Description used to identify the delegated prefix name from the parent PD (Prefix Delegation) server. If the name contains spaces then you must enclose it in "quotation marks".
<code><ipv6-prefix/prefix-length></code>	Specify an IPv6 prefix and prefix length. The prefix length indicates the length of the IPv6 prefix assigned to the pool. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.
<code><assigned-length></code>	Specify an IPv6 prefix length assigned to the user from the pool in the range <1-128>. Note that the value of the <i>assigned-length</i> parameter entered cannot be less than or equal to the <i>prefix-length</i> parameter value entered. An assigned length must be longer than a prefix length.
<code>exclude-local-prefix</code>	Specify this keyword to exclude the locally assigned prefix from the pool.

Default No DHCPv6 server prefix delegation pool is configured by default.

Mode Global Configuration

Usage notes All IPv6 prefix pool names must be unique. IPv6 prefix pools have a similar function to IPv4 address pools. Contrary to IPv4, a block of IPv6 addresses (an IPv6 address prefix) are assigned and not single IPv6 addresses. IPv6 prefix pools are not allowed to overlap.

Once a pool is configured, it cannot be changed. To change the configuration, you must remove then recreate a IPv6 prefix pool. All IPv6 prefixes already allocated are also freed.

Examples To create a local DHCPv6 local pool named P2 with the IPv6 prefix and prefix length 2001:0db8::/32 with an assigned length of 64, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 local pool P2 2001:0db8::/32 64
```

To remove a configured DHCPv6 local pool, use the following commands:

```
awplus# configure terminal
awplus(config)# no ipv6 local pool
```

Related commands **ipv6 dhcp pool**
show ipv6 dhcp pool

ipv6 nd prefix (DHCPv6)

Overview Use this command to specify IPv6 RA (Router Advertisement) prefix information generated from the DHCPv6 server for DHCPv6 prefix-delegation for an interface.

Use the **no** variant of this command to remove IPv6 RA prefix information from the DHCPv6 Server for DHCPv6 Prefix-Delegation for the interface. Use the **all** parameter with the **no** variant of this command to remove all prefix names and all prefixes for an interface.

Syntax `ipv6 nd prefix <ipv6-prefix-name> <ipv6-prefix/length>{<valid-lifetime>|infinite} {<preferred-lifetime>|infinite} {off-link|no-autoconfig}`
`no ipv6 nd prefix {<ipv6-prefix-name>|<ipv6-prefix/length>|all}`

Parameter	Description
<code><ipv6-prefix-name></code>	The IPv6 prefix name advertised on the router advertisement message sent from the device. The IPv6 prefix name is delegated from the DHCPv6 Server configured for DHCPv6 Prefix-Delegation.
<code><ipv6-prefix/length></code>	The IPv6 prefix and prefix length advertised on the router advertisement message sent from the device. The IPv6 address prefix uses the format X:X::/prefix-length. The prefix-length is usually set between 0 and 64.
<code><valid-lifetime></code>	The the period during which the specified IPv6 address prefix is valid. This can be set to a value between 5 and 315360000 seconds. Note that this period should be set to a value greater than that set for the prefix preferred-lifetime. See the Usage notes after this parameter table for a description of valid lifetime and how it determines invalid IPv6 addresses upon expiry.
<code>infinite</code>	Specifying this keyword instead of entering a value for the <code><valid-lifetime></code> parameter applies an infinite valid lifetime.
<code><preferred-lifetime></code>	Specifies the IPv6 prefix preferred lifetime. This is the period during which the IPv6 address prefix is considered current. Set this to a value between 0 and 315360000 seconds. Note that this period should be set to a value less than that set for the prefix valid-lifetime. See the Usage notes after this parameter table for a description of preferred lifetime and how it determines deprecated IPv6 addresses upon expiry.
<code>infinite</code>	Specifying this keyword instead of entering a value for the <code><preferred-lifetime></code> parameter applies an infinite valid lifetime.
<code>off-link</code>	Specify the IPv6 prefix off-link flag.
<code>no-autoconfig</code>	Specify the IPv6 prefix no autoconfiguration flag. Setting this flag indicates that the prefix is not to be used for autoconfiguration.
<code>all</code>	Specify all prefix names and all prefixes are removed when used with the no variant of this command.

Mode Interface Configuration for VLAN interfaces.

Usage notes This command specifies the IPv6 prefix flags that are advertised by the router advertisement message.

Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires.

Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected.

An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.

Examples The following example configures the device to issue RAs (Router Advertisements) on the VLAN interface vlan2, and advertises the DHCPv6 prefix name prefix1 and the IPv6 address prefix of 2001:0db8::/32.

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# ipv6 enable
awplus(config-if)# ipv6 dhcp client pd prefix1
awplus(config-if)# ipv6 nd prefix prefix1 2001:0db8::/32
```

The following example resets router advertisements on the VLAN interface vlan2, so the address prefix of 2001:0db8::/32 is not advertised from the device.

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd prefix 2001:0db8::/32
```

The following example removes all prefix names and prefixes from VLAN interface vlan2:

```
awplus# configure terminal
awplus(config)# interface vlan2
awplus(config-if)# no ipv6 nd prefix all
```

Related commands

- ipv6 address (DHCPv6 PD)**
- ipv6 dhcp client pd**
- ipv6 dhcp pool**
- ipv6 local pool**
- prefix-delegation pool**
- show ipv6 dhcp binding**

link-address

Overview Use this command in DHCPv6 Configuration mode to specify a link-address prefix within a DHCPv6 Server pool.

Note that you can only configure one link address per DHCPv6 pool. Configuring another link address in the same DHCPv6 pool overwrites the previously configured link address.

Use the **no** variant of this command to remove the link-address prefix from the DHCPv6 Server pool.

Syntax link-address <ipv6-prefix/prefix-length>
no link-address

Parameter	Description
<ipv6-prefix/prefix-length>	Specify an IPv6 prefix and prefix length. The prefix length indicates the length of the IPv6 prefix assigned to the pool. The IPv6 address uses the format X:X::X:X/Prefix-Length. The prefix-length is usually set between 0 and 64.

Default No DHCPv6 Server pool configuration link address prefix is configured by default.

Mode DHCPv6 Configuration

Usage notes Link addresses are configured in DHCPv6 Server address pools when there are remote clients that communicate via intermediate relay(s).

RELAY-FORW and RELAY-REPL relay packets contain the requesting link address source.

This command is used to match incoming requests from PD (Prefix Delegation) clients (received via an intermediate relay) to a configured delegation pool.

When an address on the incoming interface of the DHCPv6 server or a link address set in the incoming delegation request packet from the prefix delegation client matches the link-address prefix configured in the delegation pool, the DHCPv6 server is able to match and use the appropriate delegation pool for relayed delegation request messages.

If there is no match between incoming delegation request packets from the prefix delegation client and the link-address prefix configured in the delegation pool, the DHCPv6 Server does not delegate an IPv6 prefix to the requesting device.

The link address should be set to the network prefix where the prefix delegation client resides. The prefix delegation server will also need a forwarding path (IPv6 route) back to the network prefix where the prefix delegation client resides.

For more information, see the [DHCPv6 Feature Overview and Configuration Guide](#).

Examples To configure the IPv6 prefix and prefix length 2001:0db8:1::/48 as the link address for pool P2, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# address prefix 2001:0db8:2::/48
awplus(config-dhcp6)# link-address 2001:0db8:1::/48
```

To remove the link address, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# no link-address
```

Related commands [ipv6 dhcp pool](#)
[show ipv6 dhcp pool](#)

option (DHCPv6)

Overview Use this command in DHCPv6 Configuration mode to add a user-defined option to the DHCPv6 prefix pool you are configuring. For the **hex**, **integer**, and **flag** option types, if the option already exists, the new option overwrites the existing option's value.

Use the **no** variant of this command to remove the specified user-defined option from the DHCPv6 server pool, or to remove all user-defined options from the DHCPv6 server pool.

Syntax option [<1-254>|<option-name>] <option-value>
no option [<1-254>|<option-value>]

Parameter	Description
<1-254>	The option number of the option. Options with the same number as one of the standard options overrides the standard option definition.
<option-name>	Option name associated with the option.
<option-value>	The option value. You must specify a value that is appropriate to the option type: hex A hexadecimal string. Valid characters are the numbers 0–9 and letters a–f. Embedded spaces are not valid. The string must be an even number of characters, from 2 and 256 characters long. ipv6 An IPv6 prefix that has the hexadecimal X:X::X:X notation. To create a list of IPv6 prefixes, you must add each IPv6 prefix individually using this command multiple times. integer A number from 0 to 4294967295. flag A value of either true, on, or enabled to set the flag, or false, off or disabled to unset the flag.

Mode DHCPv6 Configuration

Usage You must define a DHCPv6 option using the **ipv6 dhcp option** command before using the **option (DHCPv6)** command.

Note that options with an **ipv6** type can hold a list of IPv6 prefix (i.e. entries that have the X:X::X:X address format), so if the option already exists in the pool, then the new IP address is added to the list of existing IPv6 prefixes. Also note options with the same number as one of the pre-defined options override the standard option definition. The pre-defined options use the option numbers 1, 3, 6, 15, and 51.

Examples To add the IPv6 type option named `sntp-server-addr` to the pool P2 and give the option the value `ipv6`, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp option 22 name sntp_server_addr ipv6
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# option sntp_server_addr ipv6
```

To add the ASCII-type option named `tftp-server-name` to the pool P2 and give the option the value `server1`, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# option tftp-server-name server1
```

To add the hex-type option named `tcpip-node-type` to the pool P2 and give the option the value `08af`, use the following commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# option tcpip-node-type 08af
```

To add multiple IP addresses for the ip-type option 175, use the following commands:

```
awplus(config-dhcp6)# option 175 2001:0db8:3001::/64
awplus(config-dhcp6)# option 175 2001:0db8:3002::/64
awplus(config-dhcp6)# option 175 2001:0db8:3003::/64
```

To add the option 179 to a pool, and give the option the value 123456, use the following command:

```
awplus(config-dhcp6)# option 179 123456
```

To add a user-defined flag option with the name `perform-router-discovery`, use the following command:

```
awplus(config-dhcp6)# option perform-router-discovery yes
```

To clear all user-defined options from a DHCP address pool, use the following command:

```
awplus(config-dhcp6)# no option
```

To clear a user-defined option, named `tftp-server-name`, use the following command:

```
awplus(config-dhcp6)# no option tftp-server-name
```

Related **dns-server (DHCPv6)**
commands **ipv6 dhcp option**
ipv6 dhcp pool
show ipv6 dhcp pool

prefix-delegation pool

Overview Use this command in DHCPv6 Configuration mode to add a DHCPv6 server prefix-delegation pool entry to the current DHCPv6 pool configuration. You must define a DHCPv6 server prefix-delegation pool using the **ipv6 dhcp pool** command before using this command.

Use the **no** variant of this command to remove a DHCPv6 server prefix-delegation pool from the current DHCPv6 pool configuration.

Syntax `prefix-delegation pool <DHCPv6-poolname> [lifetime {<valid-time>|infinite} {<preferred-time>|infinite}]`
`no prefix-delegation pool <DHCPv6-poolname>`

Parameter	Description
<code><DHCPv6-poolname></code>	Description used to identify this DHCPv6 server pool. Valid characters are any printable character. If the name contains spaces then you must enclose it in "quotation marks".
<code>lifetime</code>	Optional. Specify a time period for the hosts to remember router advertisements (RAs). If you specify this parameter then you must also specify a <i>valid-time</i> and a <i>preferred-time</i> value. See the Usage notes below this parameter table for a description of preferred and valid lifetimes and how these determine deprecated or invalid IPv6 addresses upon expiry.
<code><valid-time></code>	Specify a valid lifetime in seconds in the range <5-315360000>.
<code>infinite</code>	Specify an infinite valid lifetime or an infinite preferred lifetime, or both, when using this keyword.
<code><preferred-time></code>	Specify a valid lifetime in seconds in the range <5-315360000>.

Default No IPv6 local prefix pool is specified by default.

Mode DHCPv6 Configuration

Usage notes The DHCPv6 server assigns prefixes dynamically from an IPv6 local prefix pool, which is configured using the **ipv6 local pool** command and is associated with a DHCPv6 configuration pool using this command. When the server receives a prefix request from a client, it attempts to obtain unassigned prefixes from the pool. After the client releases the previously assigned prefixes, the server returns the prefixes to the pool for reassignment.

Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires.

Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected.

An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.

Example This example adds DHCPv6 Prefix Delegation pool pd_pool1 to DHCPv6 pool pool1:

```
awplus# configure terminal
awplus(config)# ipv6 local pool pd_pool1 2001:0db8::/48 56
awplus(config)# ipv6 dhcp pool pool1
awplus(config-dhcp6)# prefix-delegation pool pd_pool1
```

Related commands **ipv6 dhcp pool**
ipv6 local pool
show ipv6 dhcp pool

service dhcp-relay

Overview This command enables the DHCP Relay Agent on the device. However, on a given IP interface, no DHCP forwarding takes place until at least one DHCP server is specified to forward/relay all clients' DHCP packets to.

The **no** variant of this command disables the DHCP Relay Agent on the device for all interfaces.

Syntax service dhcp-relay
no service dhcp-relay

Mode Global Configuration

Usage notes A maximum number of 400 DHCP Relay Agents (one per interface) can be configured on the device. Once this limit has been reached, any further attempts to configure DHCP Relay Agents will not be successful.

Default The DHCP-relay service is enabled by default.

Examples To enable the DHCP relay global function, use the commands:

```
awplus# configure terminal
awplus(config)# service dhcp-relay
```

To disable the DHCP relay global function, use the commands:

```
awplus# configure terminal
awplus(config)# no service dhcp-relay
```

Related commands

- ip dhcp-relay agent-option**
- ip dhcp-relay agent-option checking**
- ip dhcp-relay information policy**
- ip dhcp-relay maxhops**
- ip dhcp-relay server-address**

show counter dhcp-relay

Overview This command shows counters for the DHCP Relay Agent on your device.
For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show counter dhcp-relay

Mode User Exec and Privileged Exec

Examples To display counters for the DHCP Relay Agent on your device, use the following command:

```
awplus# show counter dhcp-relay
```

Output The following shows typical output.

Example output from the show counter dhcp-relay command

```
awplus#show counter dhcp-relay

DHCP relay counters
Requests In           ..... 4
Replies In            ..... 4
Relayed To Server     ..... 4
Relayed To Client     ..... 4
Out To Server Failed  ..... 0
Out To Client Failed  ..... 0
Invalid hlen          ..... 0
Bogus giaddr          ..... 0
Corrupt Agent Option  ..... 0
Missing Agent Option  ..... 0
Bad Circuit ID        ..... 0
Missing Circuit ID     ..... 0
Bad Remote ID         ..... 0
Missing Remote ID     ..... 0
Option Insert Failed  ..... 0
DHCPv6 Requests In   ..... 0
DHCPv6 Replies In     ..... 0
DHCPv6 Relayed to Server ..... 0
DHCPv6 Relayed to Client ..... 0
```

Parameter	Description
Requests In	The number of DHCP Request messages received from clients.
Replies In	The number of DHCP Reply messages received from servers.
Relayed To Server	The number of DHCP Request messages relayed to servers.
Relayed To Client	The number of DHCP Reply messages relayed to clients.
Out To Server Failed	The number of failures when attempting to send request messages to servers. This is an internal debugging counter.
Out To Client Failed	The number of failures when attempting to send reply messages to clients. This is an internal debugging counter.
Invalid hlen	The number of incoming messages dropped due to an invalid hlen field.
Bogus giaddr	The number of incoming DHCP Reply messages dropped due to the bogus giaddr field.
Corrupt Agent Option	The number of incoming DHCP Reply messages dropped due to a corrupt relay agent information option field.

Parameter	Description
	Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command.
Missing Agent Option	The number of incoming DHCP Reply messages dropped due to a missing relay agent information option field. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command.
Bad Circuit ID	The number of incoming DHCP Reply messages dropped due to a bad circuit ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Missing Circuit ID	The number of incoming DHCP Reply messages dropped due to a missing circuit ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Bad Remote ID	The number of incoming DHCP Reply messages dropped due to a bad remote ID. Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Missing Remote ID	The number of incoming DHCP Reply messages dropped due to a missing remote ID.

Parameter	Description
	Note that Agent Option counters only increment on errors occurring if the ip dhcp-relay agent-option command is configured for an interface. Messages generating the errors are only dropped if the ip dhcp-relay agent-option checking command is configured on the interface as well as the ip dhcp-relay agent-option command
Option Insert Failed	The number of incoming DHCP Request messages dropped due to an error adding the DHCP Relay Agent information (option-82). This counter increments when: - the DHCP Relay Agent is set to drop packets with the DHCP Relay Agent Option 82 field already filled by another DHCP Relay Agent. This policy is set with the ip dhcp-relay information policy command. - there is a packet error that stops the DHCP Relay Agent from being able to append the packet with its DHCP Relay Agent Information Option (Option 82) field.
DHCPv6 Requests In	The number of incoming DHCPv6 Request messages.
DHCPv6 Replies In	The number of incoming DHCPv6 Reply messages.
DHCPv6 Relayed to Server	The number of DHCPv6 messages relayed to the server.
DHCPv6 Relayed to Client	The number of DHCPv6 messages relayed to the client.

show counter ipv6 dhcp-client

Overview Use this command in User Exec or Privilege Exec mode to show DHCPv6 client counter information. See [show counter ipv6 dhcp-server](#) for DHCPv6 server information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show counter ipv6 dhcp-client

Mode User Exec and Privileged Exec

Example To display the DHCPv6 client counter information, use the command:

```
awplus# show counter ipv6 dhcp-client
```


Output The following shows typical output.

Example output from the show counter ipv6 dhcp-client command

```
awplus#show counter ipv6 dhcp-client
SOLICIT out      ..... 20
ADVERTISE in     ..... 12
REQUEST out      ..... 1
CONFIRM out      ..... 0
RENEW out        ..... 0
REBIND out       ..... 0
REPLY in         ..... 0
RELEASE out      ..... 0
DECLINE out      ..... 0
INFORMATION-REQUEST out ..... 0
```

Parameters in the output of the show counter ipv6 dhcp-client command

Parameter	Description
SOLICIT out	Displays the count of SOLICIT messages sent by the DHCPv6 client.
ADVERTISE in	Displays the count of ADVERTISE messages received by the DHCPv6 client.
REQUEST out	Displays the count of REQUEST messages sent by the DHCPv6 client.
CONFIRM out	Displays the count of CONFIRM messages sent by the DHCPv6 client.
RENEW out	Displays the count of RENEW messages sent by the DHCPv6 client.
REBIND out	Displays the count of REBIND messages sent by the DHCPv6 client.
REPLY in	Displays the count of REPLY messages received by the DHCPv6 client.
RELEASE out	Displays the count of RELEASE messages sent by the DHCPv6 client.
DECLINE out	Displays the count of DECLINE messages sent by the DHCPv6 client.
INFORMATION-REQUEST out	Displays the count of INFORMATION-REQUEST messages sent by the DHCPv6 client.

Related commands [show counter ipv6 dhcp-server](#)

show counter ipv6 dhcp-server

Overview Use this command in User Exec or Privileged Exec mode to show DHCPv6 server counter information. See [show counter ipv6 dhcp-client](#) for DHCPv6 client information.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show counter ipv6 dhcp-server

Mode User Exec and Privileged Exec

Example To display the DHCPv6 server counter information, use the command:

```
awplus# show counter ipv6 dhcp-server
```

Output The following shows typical output.

Example output from the show counter ipv6 dhcp-server command

```
awplus#show counter ipv6 dhcp-server
SOLICIT in                ..... 20
ADVERTISE out             ..... 12
REQUEST in                ..... 1
CONFIRM in                ..... 0
RENEW in                  ..... 0
REBIND in                 ..... 0
REPLY out                 ..... 0
RELEASE in                ..... 0
DECLINE in                ..... 0
INFORMATION-REQUEST in    ..... 0
RELAY FORWARD in         ..... 0
LEASEQUERY in             ..... 0
DHCPv4 QUERY in          ..... 0
```

Parameters in the output of the show counter ipv6 dhcp-server command

Parameter	Description
SOLICIT in	Displays the count of SOLICIT messages received by the DHCPv6 server.
ADVERTISE out	Displays the count of ADVERTISE messages sent by the DHCPv6 server.
REQUEST in	Displays the count of REQUEST messages received by the DHCPv6 server.
CONFIRM in	Displays the count of CONFIRM messages received by the DHCPv6 server.
RENEW in	Displays the count of RENEW messages received by the DHCPv6 server.
REBIND in	Displays the count of REBIND messages received by the DHCPv6 server.
REPLY out	Displays the count of REPLY messages sent by the DHCPv6 server.
RELEASE in	Displays the count of RELEASE messages received by the DHCPv6 server.
DECLINE in	Displays the count of DECLINE messages received by the DHCPv6 server.
INFORMATION-REQUEST in	Displays the count of INFORMATION-REQUEST messages received by the DHCPv6 server
RELAY FORWARD in	Displays the count of Relay forward in messages received by the DHCPv6 server

Parameter	Description
LEASEQUERY in	Displays the count of LEASE QUERY messages received by the DHCPv6 server
DHCPv4 QUERY in	Displays the count of DHCPv4 QUERY messages received by the DHCPv6 server

Related commands [show counter ipv6 dhcp-client](#)

show ip dhcp-relay

Overview This command shows the configuration of the DHCP Relay Agent on each interface.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ip dhcp-relay [interface <interface-name>]

Parameter	Description
<interface-name>	Name of a specific interface. This displays the DHCP configuration for the specified interface only.

Mode User Exec and Privileged Exec

Example To display the DHCP Relay Agent’s configuration on the interface vlan2, use the command:

```
awplus# show ip dhcp-relay interface vlan2
```

Output The following shows typical output.

Example output from the show ip dhcp-relay command

```
DHCP Relay Service is enabled
vlan2 is up, line protocol is up
Maximum hop count is 10
Maximum DHCP message length is 1400
DHCP Relay short lease time for IPv4 is 200 seconds
DHCP Relay short lease time for IPv6 are 2000/1900 (valid/
preferred) seconds
Insertion of Relay Agent Option is disabled
Checking of Relay Agent Option is disabled
The Remote Id string for Relay Agent Option is 0000.cd28.074c
Relay information policy is to append new relay agent
information
List of servers : 192.168.1.200
```

Related commands

- [ip dhcp-relay agent-option](#)
- [ip dhcp-relay agent-option checking](#)
- [ip dhcp-relay information policy](#)
- [ip dhcp-relay maxhops](#)
- [ip dhcp-relay server-address](#)

show ipv6 dhcp

Overview Use this command in User Exec or Privileged Exec mode to show the DHCPv6 unique identifier (DUID) configured on your device.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 dhcp

Mode User Exec and Privileged Exec

Usage notes The DUID is based on the link-layer address for both DHCPv6 client and DHCPv6 server identifiers. The device uses the MAC address from the lowest interface number for the DUID.

The DUID is used by a DHCPv6 client to obtain an IPv6 address from a DHCPv6 server. A DHCPv6 server compares the DUID with its database of DUIDs and sends configuration data for an IPv6 address plus the preferred and valid lease time values to a DHCPv6 client.

Example To display the DUID configured on your device, use the command:

```
awplus# show ipv6 dhcp
```

Output The following shows typical output.

Example output from the show ipv6 dhcp command

```
awplus#show ipv6 dhcp
DHCPv6 Server DUID: 0001000117ab6876001577f7ba23
```

Related commands [ipv6 address dhcp](#)

show ipv6 dhcp binding

Overview Use this command in User Exec or Privileged Exec mode to show the IPv6 address entries that the DHCPv6 server leases to DHCPv6 clients. Note that applying this command with the optional *summary* keyword parameter displays the number of addresses per pool, but not the address or prefix entries per pool.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

Syntax show ipv6 dhcp binding [summary]

Parameter	Description
summary	Optional. Specify the summary keyword to display summarized information for DHCPv6 server leases to client nodes, displaying the number of address entries per pool, not the addresses or prefixes.

Mode User Exec and Privileged Exec

Example 1 To display the total DHCPv6 leasing address entries for all pools, use the command:

```
awplus# show ipv6 dhcp binding summary
```

Output The following shows typical output.

Example output from the show ipv6 dhcp binding summary command

awplus# show ipv6 dhcp binding summary	
Pool Name	Number of Leased Addresses

ia-na1	3
ia-pd1	5
Total in all Pools:	8

Parameters in the output of the show ipv6 dhcp binding summary command

Parameter	Description
Pool Name	Displays a list of all the pool names.
Number of Leased Addresses	Displays the number of leased address entries for the pool.
Total in all Pools	Displays the total number of leased address entries for all pools.

Example 2 To display addresses, prefixes, and lifetimes for all DHCPv6 leasing entries by pool, enter:

```
awplus# show ipv6 dhcp binding
```


Output The following shows typical output.

Example output from the show ipv6 dhcp binding command

```
awplus#show ipv6 dhcp binding
Pool ia-na1
  Address 2002:0:3c0::1
    client IAID 77f7ba23, DUID 0001000117c4bbb4001577f7ba23
    preferred lifetime 604800, valid lifetime 2592000
    starts at 20 Aug 2012 18:38:29
    expires at 19 Sep 2012 18:38:29
Pool ia-pd1
  Prefix 2002:0:3c0::/42
    client IAID 77f7ba23, DUID 0001000117c4bbb4001577f7ba23
    preferred lifetime 604800, valid lifetime 2592000
    starts at 20 Aug 2012 18:38:29
    expires at 19 Sep 2012 18:38:29
```

Parameters in the output of the show ipv6 dhcp binding command

Parameter	Description
Address	Address delegated to the indicated IAID and DUID. See the IAID and DUID descriptions below for further information.
Prefix	Prefix delegated to the indicated IAID and DUID. See the IAID and DUID descriptions below for further information.
DUID	DHCPv6 unique identifier (DUID) (see RFC 3315). Each DHCPv6 client has as DUID. DHCPv6 servers use DUIDs to identify clients for the association of IAs (Identity Associations) with DHCPv6 clients. DHCPv6 clients use DUIDs to identify a DHCPv6 server.
IAID	Identify Association Identifier (IAID) (see RFC 3315). IAIDs are identifiers for IAs (Identity Associations), where an IA is a collection of IPv6 addresses assigned to a DHCPv6 client. Each IA has an associated IAD. Each DHCPv6 client may have more than one IA assigned to it. Each IA holds one type of address.
preferred lifetime	The preferred lifetime setting in seconds for the specified IAID and DUID. Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires. Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected.
valid lifetime	The valid lifetime setting in seconds for the specified IAID and DUID.

Parameter	Description
	An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.
starts at	The date and time at which the valid lifetime expires.
expires at	The date and time at which the valid lifetime expires.

Related commands

- [clear ipv6 dhcp binding](#)
- [ipv6 dhcp pool](#)
- [show ipv6 dhcp pool](#)

show ipv6 dhcp interface

Overview Use this command in User Exec or Privileged Exec mode to display DHCPv6 information for a specified interface, or all interfaces when entered without the interface parameter.

For information on filtering and saving command output, see the **“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide**.

Syntax show ipv6 dhcp interface [<interface-name>]

Parameter	Description
<interface-name>	Optional. Specify the name of the interface to show DHCPv6 information about. Omit this optional parameter to display DHCPv6 information for all interfaces DHCPv6 is configured on.

Mode User Exec and Privileged Exec

Example To display DHCPv6 information for all interfaces DHCPv6 is configured on, use the command:

```
awplus# show ipv6 dhcp interface
```

To display DHCPv6 information for interface vlan2, use the command:

```
awplus# show ipv6 dhcp interface vlan2
```

Output The following shows typical output.

Example output from the show ipv6 dhcp interface command

```
awplus# show ipv6 dhcp interface
vlan1 is in client mode
  Address 1001::3c0:1
    preferred lifetime 9000, valid lifetime 5000
    starts at 20 Jan 2021 09:21:35
    expires at 20 Jan 2021 10:25:32
vlan2 is in client (Prefix-Delegation) mode
  Prefix name pd1
    prefix 2002:0:3c0::/42
    preferred lifetime 604800, valid lifetime 2592000
    starts at 20 Aug 2021 09:21:33
    expires at 19 Sep 2021 09:21:33
vlan3 is in server mode
  Using pool : pool-1; Preference:0
```

**Example
output from
the show
ipv6 dhcp
interface
command
for a specific
interface**

```
awplus# show ipv6 dhcp interface vlan2
vlan2 is in client (Prefix-Delegation) mode
Prefix name pd1
  prefix 2002:0:3c0::/42
  preferred lifetime 604800, valid lifetime 2592000
  starts at 20 Aug 2021 09:21:33
  expires at 19 Sep 2021 09:21:33
```

Parameters in the output of the show counter dhcp-client command

Parameter	Description
<interface> is in server/client/(Prefix-Delegation) mode	Displays whether the specified interface is in server or client mode and whether prefix-delegation is applied to an interface.
Address	Displays the address of the DHCPv6 server on the interface.
Prefix name	Displays the IPv6 general prefix pool name, where prefixes are stored for the interface.
Using pool	Displays the name of the pool used by the interface.
Preference	Displays the preference value for the DHCPv6 server.

Related commands [ipv6 dhcp client pd](#)

show ipv6 dhcp pool

Overview Use this command in User Exec or Privileged Exec mode to display the configuration details and system usage of the DHCPv6 address pools configured on the device.

For information on filtering and saving command output, see the **[“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#)**.

Syntax show ipv6 dhcp pool [*<DHCPv6-address-pool-name>*]

Parameter	Description
<i><DHCPv6-address-pool-name></i>	Name of a specific DHCPv6 address pool. This displays the configuration of the specified DHCPv6 address pool only.

Mode User Exec and Privileged Exec

Example awplus# show ipv6 dhcp pool

Output The following shows typical output.

Example output from the show ipv6 dhcp pool command

```
awplus# show ipv6 dhcp pool
DHCPv6 Pool: ia-na
Address Prefix : 1001::/64
Lifetime: 2592000(valid), 604800(preferred)
DNS Server: 2001::1
DNS Server: 2001::2
Domain Name: example.com
Domain Name: example.co.jp
SNTP Server: 2001::5
SNTP Server: 2001::6
Option Code : 150
Value: [ASCII] test-test
DHCPv6 Pool: ia-pd
PD Pool Name: pd1
Prefix : 2002::/38-42
Lifetime : 2592000(valid), 604800(preferred)
```

Parameters in the output of the show ipv6dhcp pool command

Parameter	Description
DHCPv6 Pool	Name of the DHCPv6 pool.
Address Prefix	Address prefix to the DHCPv6 pool.
Address Lifetime	Valid and preferred lifetimes to the DHCPv6 pool. Preferred IPv6 addresses or prefixes are available to interfaces for unrestricted use and are deprecated when the preferred timer expires. Deprecated IPv6 addresses and prefixes are available for use and are discouraged but not forbidden. A deprecated address or prefix should not be used as a source address or prefix, but packets sent from deprecated addresses or prefixes are delivered as expected. An IPv6 address or prefix becomes invalid and is not available to an interface when the valid lifetime timer expires. Invalid addresses or prefixes should not appear as the source or destination for a packet.
DNS Server	IPv6 address of the DNS Server
Domain name	URL for the domain name.
SNTP Server	IPv6 address of the SNTP (Simple Network Time Protocol) Server.
Option Code	DHCP Option code (see RFC 2132).
Option Value	DHCP Option value type (see RFC 2132).

Related commands [ipv6 dhcp pool](#)

sntp address

Overview Use this command in DHCPv6 Configuration mode to add an SNTP Server IPv6 address to a DHCPv6 Server pool. SNTP is Simple Network Time Protocol.

Use the **no** variant of this command to remove an SNTP Server IPv6 address from a DHCPv6 Server pool.

Syntax sntp address {<ipv6-address>|interface <server-interface>}
no sntp address {<ipv6-address>|interface <server-interface>}

Parameter	Description
<ipv6-address>	Specify an SNTP Server IPv6 address, in hexadecimal notation in the format X:X::X:X.
interface <server- interface>	Source the IPv6 address from an interface.

Mode DHCPv6 Configuration

Examples To add an SNTP Server IPv6 address of 2001:0db8::/32 to the DHCPv6 pool named P2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# sntp address 2001:0db8::/32
```

To remove an SNTP Server IPv6 address of 2001:0db8::/32 from the DHCPv6 pool named P2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# no sntp address 2001:0db8::/32
```

To add the SNTP Server that has a dynamic address source of vlan10 to the DHCPv6 pool named P2, use the commands:

```
awplus# configure terminal
awplus(config)# ipv6 dhcp pool P2
awplus(config-dhcp6)# sntp address interface vlan10
```

Related commands

- dns-server (DHCPv6)**
- domain-name (DHCPv6)**
- option (DHCPv6)**
- show ipv6 dhcp pool**

59

NTP Commands

- Contents**
- **Introduction** on page 3213
 - **ntp authentication-key** on page 3214
 - **ntp broadcastdelay** on page 3216
 - **ntp master** on page 3217
 - **ntp peer** on page 3218
 - **ntp rate-limit** on page 3220
 - **ntp restrict** on page 3221
 - **ntp server** on page 3223
 - **ntp source** on page 3225
 - **show ntp associations** on page 3227
 - **show ntp counters** on page 3230
 - **show ntp counters associations** on page 3231
 - **show ntp status** on page 3232

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure the Network Time Protocol (NTP). For more information, see the [NTP Feature Overview and Configuration Guide](#).

The device can act as an NTP client to receive time from one or more NTP servers, and as an NTP server.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare_Plus” Feature Overview and Configuration Guide](#).

ntp authentication-key

Overview This command defines each of the authentication keys. Each key has a key number, a type (MD5 or SHA1), and a value.

The **no** variant of this disables the authentication key.

Syntax `ntp authentication-key <keynumber> md5 <key-string> [trusted]`
`ntp authentication-key <keynumber> sha1 <key-string> [trusted]`

When in secure mode, MD5 is not available and the syntax in config files will be:

`ntp authentication-key <keynumber> sha1-encrypted <encrypted-key-string> [trusted]`

`no ntp authentication-key <keynumber>`

Parameter	Description
<keynumber>	<1-4294967295> An identification number for the key.
md5	Define an MD5 key.
sha1	Define an SHA1 key.
<key-string>	The authentication key. For SHA1, this is a 20 hexadecimal character string. For MD5, this is a string of up to 31 ASCII characters.
sha1-encrypted	This parameter indicates in running config that the key is in its encrypted form instead of in plaintext. If secure mode is enabled and you enter a SHA1 key, the running config will display this sha1-encrypted parameter instead of sha1, and will display the key in encrypted form. Do not enter a key using the sha1-encrypted parameter. Instead, enter sha1 and the unencrypted key string.
<encrypted-key-string>	The encrypted authentication key.
trusted	Add this key to the list of authentication keys that this server trusts.

Mode Global Configuration

Examples To define an MD5 authentication key number 134343 and a key value 'mystring', use the commands:

```
awplus# configure terminal
awplus(config)# ntp authentication-key 134343 md5 mystring
```

To disable the authentication key number 134343 with the key value 'mystring', use the commands:

```
awplus# configure terminal
awplus(config)# no ntp authentication-key 134343
```

Command changes Version 5.4.9-2.1 sha1-encrypted parameter added.

ntp broadcastdelay

Overview Use this command to set the estimated round-trip delay for broadcast packets.

Use the **no** variant of this command to reset the round-trip delay for broadcast packets to the default offset of 0 microseconds.

Syntax ntp broadcastdelay <delay>
no ntp broadcastdelay

Parameter	Description
<delay>	<1-999999> The broadcast delay in microseconds.

Default 0 microsecond offset, which can only be applied with the **no** variant of this command.

Mode Global Configuration

Examples To set the estimated round-trip delay to 23464 microseconds for broadcast packets, use these commands:

```
awplus# configure terminal
awplus(config)# ntp broadcastdelay 23464
```

To reset the estimated round-trip delay for broadcast packets to the default setting (0 microseconds), use these commands:

```
awplus# configure terminal
awplus(config)# no ntp broadcastdelay
```

ntp master

Overview Use this command to make the device to be an authoritative NTP server, even if the system is not synchronized to an outside time source.

Use the **no** variant of this command to stop the device being the designated NTP server.

Syntax ntp master [<stratum>]
no ntp master

Parameter	Description
<stratum>	<1-15> The stratum number defines the configured level that is set for this master within the NTP hierarchy. The default stratum number is 12.

Mode Global Configuration

Usage notes The stratum levels define the distance from the reference clock and exist to prevent cycles in the hierarchy. Stratum 1 is used to indicate time servers, which are more accurate than Stratum 2 servers. For more information on the Network Time Protocol go to: www.ntp.org

Examples To stop the device from being the designated NTP server, use the commands:

```
awplus# configure terminal
awplus(config)# no ntp master
```

To make the device the designated NTP server with stratum number 2, use the commands:

```
awplus# configure terminal
awplus(config)# ntp master 2
```

ntp peer

Overview Use this command to configure an NTP peer association. An NTP association is a peer association if this system is willing to either synchronize to the other system, or allow the other system to synchronize to it.

Use the **no** variant of this command to remove the configured NTP peer association.

Syntax `ntp peer {<peeraddress>|<peername>} [prefer] [key <key>]
[version <version>]
no ntp peer {<peeraddress>|<peername>}`

Parameter	Description
<code><peeraddress></code>	Specify the IP address of the peer, entered in the form A.B.C.D for an IPv4 address, or in the form X:X::X:X for an IPv6 address.
<code><peername></code>	Specify the peer hostname. The peer hostname can resolve to an IPv4 and an IPv6 address.
<code>prefer</code>	Prefer this peer when possible.
<code>key <key></code>	<code><1-4294967295></code> Configure the peer authentication key.
<code>version <version></code>	<code><1-4></code> Configure for this NTP version.

Mode Global Configuration

Examples To set an NTP peer association for this peer with an IPv4 address of 192.0.2.23, use the commands:

```
awplus# configure terminal
awplus(config)# ntp peer 192.0.2.23
```

To remove an NTP peer association for this peer with an IPv4 address of 192.0.2.23, use the commands:

```
awplus# configure terminal
awplus(config)# no ntp peer 192.0.2.23
```

To set an NTP peer association for this peer with an IPv6 address of 2001:0db8:010d::1, use the commands:

```
awplus# configure terminal
awplus(config)# ntp peer 2001:0db8:010d::1
```

To remove an NTP peer association for this peer with an IPv6 address of 2001:0db8:010d::1, use the following commands:

```
awplus# configure terminal
awplus(config)# no ntp peer 2001:0db8:010d::1
```

To set the preferred peer to be IPv4 192.0.2.23 and the version to 4, with the authentication key '1234', use the commands:

```
awplus# configure terminal
awplus(config)# ntp peer 192.0.2.23 prefer version 4 key 1234
```

Related commands [ntp server](#)
[ntp source](#)

ntp rate-limit

Overview Use this command to enable NTP server response rate-limiting. Limiting NTP server responses can reduce network traffic when occurrences such as misconfigured or broken NTP clients poll the NTP server too frequently. Excessive polling can lead to network overload.

Use the **no** variant of this command to remove the rate-limit configuration.

Syntax `ntp rate-limit {interval<1-4096>|burst <1-255>|leak <2-16>}`
`no ntp rate-limit`

Parameter	Description
interval	The minimum interval between responses configured in seconds. The default interval is 8 seconds.
burst	The maximum number of responses that can be sent in a burst, temporarily exceeding the limit specified by the interval option. The default burst is 8 responses.
leak	The rate at which responses are randomly allowed even if the limits specified by the interval and burst options are exceeded. The default leak is 4, i.e. on average, every fourth request has a response.

Mode Global Configuration

Default Interval - 8 seconds.
Burst - 8 responses.
Leak - 4.

Example To configure an NTP rate-limiting interval of 30 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# ntp rate-limit interval 30
```

Related commands [ntp restrict](#)
Command changes Version 5.4.8-1.1: command added

ntp restrict

Overview Use this command to configure a restriction (allow or deny) on NTP packets or NTP functionality for a specific host/network or all hosts of a given IP family.

This means you can control host access to NTP service and NTP server status queries.

Use the **no** variant of this command to remove a restriction from one or more hosts.

Syntax `ntp restrict {default-v4|default-v6|<host-address>|<host-subnet>} {allow|deny}`
`ntp restrict {default-v4|default-v6|<host-address>|<host-subnet>} query {allow|deny}`
`ntp restrict {default-v4|default-v6|<host-address>|<host-subnet>} serve {allow|deny}`
`no ntp restrict {default-v4|default-v6|<host-address>|<host-subnet>}`

Parameter	Description
default-v4	Apply this restriction to all IPv4 hosts.
default-v6	Apply this restriction to all IPv6 hosts.
<host-address>	Apply this restriction to the specified IPv4 or IPv6 host. Enter an IPv4 address in the format A.B.C.D. Enter an IPv6 address in the format X:X::X:X.
<host-subnet>	Apply this restriction to the specified IPv4 subnet or IPv6 prefix. Enter an IPv4 subnet in the format A.B.C.D/M. Enter an IPv6 prefix in the format X:X::X/X.
query	Control NTP server status queries to matching hosts.
serve	Control NTP time service to matching hosts.
allow	Allow the configured restriction.
deny	Deny the configured restriction.

Default By default, time service is allowed to all hosts, and NTP server status querying is denied to all hosts.

Mode Global Configuration

Example To prevent all IPv4 hosts from accessing a device for NTP service, use the commands:

```
awplus# configure terminal
awplus(config)# ntp restrict default-v4 deny
```

To prevent the host 192.168.1.1 from accessing a device for NTP service, use the commands:

```
awplus# configure terminal
awplus(config)# ntp restrict 198.168.1.1 deny
```

To allow all hosts in the 10.10.10.0/24 subnet to access a device for NTP server status, use the commands:

```
awplus# configure terminal
awplus(config)# ntp restrict 10.10.10.0/24 query allow
```

Related commands
Command changes

ntp rate-limit

Version 5.4.8-1.1: command added

ntp server

Overview Use this command to configure an NTP server. This means that this system will synchronize to the other system, and not vice versa. You can configure an NTP server association by hostname or IP address.

Use the **no** variant of this command to remove the configured NTP server.

Syntax `ntp server {<serveraddress>|<servername>} [prefer] [key <key>]
[version <version>]
no ntp server {<serveraddress>|<servername>}`

Parameter	Description
<serveraddress>	Specify the IP address of the peer, entered in the form A.B.C.D for an IPv4 address, or in the form X:X::X.X for an IPv6 address.
<servername>	Specify the server hostname. The server hostname can resolve to an IPv4 and an IPv6 address.
prefer	Prefer this server when possible.
key <key>	Configure the server authentication key from the range 1 to 4294967295.
version <version>	Configure for this NTP version from the range 1 to 4.

Mode Global Configuration

Examples To obtain the time by synchronizing with the server at 192.0.1.23, use the commands:

```
awplus# configure terminal
awplus(config)# ntp server 192.0.1.23
```

To obtain the time by synchronizing with the server at 192.0.1.23, and specify that this is the best server to use, use the commands:

```
awplus# configure terminal
awplus(config)# ntp server 192.0.1.23 prefer
```

To obtain the time by synchronizing with the server at 2001:0db8:010e::2, use the commands:

```
awplus# configure terminal
awplus(config)# ntp server 2001:0db8:010e::2
```

To obtain the time by synchronizing with the server at 2001:0db8:010e::2, and specify that this is the best server to use, use the commands:

```
awplus# configure terminal
awplus(config)# ntp server 2001:0db8:010e::2 prefer
```

To stop using the time server at 2001:0db8:010e::2, use the commands:

```
awplus# configure terminal
awplus(config)# no ntp server 2001:0db8:010e::2
```

Related commands [ntp peer](#)
[ntp source](#)

ntp source

Overview Use this command to configure an IPv4 or an IPv6 address for the NTP source interface. This command defines the socket used for NTP messages, and only applies to NTP client behavior.

Note that you cannot use this command when using AMF (Allied Telesis Management Framework).

Use the **no** variant of this command to remove the configured IPv4 or IPv6 address from the NTP source interface.

Syntax ntp source <source-address>
no ntp source

Parameter	Description
<source-address>	Specify the IP address of the NTP source interface, entered in the form A.B.C.D for an IPv4 address, or in the form X:X::X.X for an IPv6 address.

Default An IP address is selected based on the most appropriate egress interface used to reach the NTP peer if a configured NTP client source IP address is unavailable or invalid.

Mode Global Configuration

Usage notes Adding an IPv4 or an IPv6 address allows you to select which source interface NTP uses for peering. The IPv4 or IPv6 address configured using this command is matched to the interface.

When selecting a source IP address to use for NTP messages to the peer, if the configured NTP client source IP address is unavailable then default behavior will apply, and an alternative source IP address is automatically selected. This IP address is based on the most appropriate egress interface used to reach the NTP peer. The configured NTP client source IP may be unavailable if the interface is down, or an invalid IP address is configured that does not reside on the device.

Note that this command only applies to NTP client behavior. The egress interface that the NTP messages use to reach the NTP server is determined by the **ntp peer** and **ntp server** commands.

Examples To configure the NTP source interface with the IPv4 address 192.0.2.23, enter the commands:

```
awplus# configure terminal
awplus(config)# ntp source 192.0.2.23
```

To configure the NTP source interface with the IPv6 address 2001:0db8:010e::2, enter the commands:

```
awplus# configure terminal
awplus(config)# ntp source 2001:0db8:010e::2
```

To remove a configured address for the NTP source interface, use the following commands:

```
awplus# configure terminal
awplus(config)# no ntp source
```

Related commands [ntp peer](#)
[ntp server](#)

show ntp associations

Overview Use this command to display the status of NTP associations.

Syntax show ntp associations

Mode User Exec and Privileged Exec

Example To display the status of NTP associations, use the command:

```
awplus# show ntp associations
```

Output The following shows typical output.

Output from show ntp associations

awplus#show ntp associations	remote	refid	st	t	when	poll	reach	delay	offset	disp
*server1.example.com										
	192.0.2.2		4	u	47	64	377	0.177	0.021	0.001
+192.168.1.10	10.32.16.80		5	u	46	64	377	0.241	-0.045	0.000
* system peer, # backup, + candidate, - outlier, x false ticker										

Parameters in the output from show ntp associations

Parameter	Description
* system peer	The peer that NTP uses to calculate variables like the offset and root dispersion of this AlliedWare Plus device. NTP passes these variables to the clients using this AlliedWare Plus device.
# backup	Peers that are usable, but are not among the first six peers sorted by synchronization distance. These peers may not be used.
+ candidate	Peers that the NTP algorithm has determined can be used, along with the system peer, to discipline the clock (i.e. to set the time on the AlliedWare Plus device).
- outlier	Peers that are not used because their time is significantly different from the other peers.
x false ticker	Peers that are not used because they are not consider trustworthy.
space	Peers that are not used because they are, for example, unreachable.
remote	The peer IP address
refid	The IP address of the reference clock, or an abbreviation indicating the type of clock (e.g. GPS indicates that the server uses GPS for the reference clock). INIT indicates that the reference clock is initializing, so it is not operational.
st	The stratum, which is the number of hops between the server and the accurate time source such as an atomic clock.
t	Type, one of: u: unicast or multicast client b: broadcast or multicast client! s: symmetric peer A: multicast server B: broadcast server M: multicast server

Parameter	Description
when	When last polled (seconds ago, h hours ago, or d days ago).
poll	Time between NTP requests from the device to the server.
reach	An indication of whether or not the NTP server is responding to requests. 0 indicates there has never been a successful poll; 1 indicates that the last poll was successful; 3 indicates that the last two polls were successful; 377 indicates that the last 8 polls were successful.
delay	The round trip communication delay to the remote peer or server, in milliseconds.
offset	The mean offset (phase) in the times reported between this local host and the remote peer or server (root mean square, milliseconds).
disp	The amount of clock error (in milliseconds) of the server due to clock resolution, network congestion, etc.

show ntp counters

Overview This command displays packet counters for NTP.

Syntax show ntp counters

Mode Privileged Exec

Example To display counters for NTP use the command:

```
awplus# show ntp counters
```

```
awplus#show ntp counters
Server Received      4
Server Dropped      0
Client Sent         90
Client Received      76
Client Valid Received 76
```

Parameters in the output from show ntp counters

Parameter	Description
Server Received	Number of NTP packets received from NTP clients.
Server Dropped	Number of NTP packets received from NTP clients but dropped.
Client Sent	Number of NTP packets sent to servers.
Client Received	Number of NTP packets received from servers
Client Valid Received	Number of valid NTP packets received from servers.

show ntp counters associations

Overview Use this command to display NTP packet counters for individual servers and peers.

Syntax show ntp counters associations

Mode Privileged Exec

Examples To display packet counters for each NTP server and peer that is associated with a device, use the command:

```
awplus# show ntp counters associations
```

Output The following shows typical output.

Example output from show ntp counters associations

```
awplus#show ntp counters associations
Peer 2001::1
  sent:          -
  received:      -
Peer 10.37.219.100
  sent:          7
  received:      7
```

Parameters in the output from show ntp counters associations

Parameter	Description
Peer	An NTP peer or server that the device is associated with.
sent	The number of NTP packets that this device sent to the peer.
received	The number of NTP packets that this device received from the peer.

Related commands [ntp restrict](#)

show ntp status

Overview Use this command to display the status of the Network Time Protocol (NTP).

Syntax show ntp status

Mode User Exec and Privileged Exec

Example To see information about NTP status, use the command:

```
awplus# show ntp status
```

For information about the output displayed by this command, see ntp.org.

Example output from show ntp status

```
awplus#show ntp status
Reference ID      : C0A8010A (192.168.1.10)
Stratum          : 4
Ref time (UTC)   : Fri Jun 15 05:32:38 2018
System time      : 0.000002004 seconds fast of NTP time
Last offset      : -0.002578615 seconds
RMS offset       : 0.000928071 seconds
Frequency        : 5.099 ppm slow
Residual freq    : -9.120 ppm
Skew             : 17.486 ppm
Precision        : -21 (0.000000477 seconds)
Root delay       : 0.031749818 seconds
Root dispersion  : 0.133974627 seconds
Update interval  : 65.3 seconds
Leap status      : Normal
```

60

SNMP Commands

- Contents**
- **Introduction** on page 3235
 - **alias (interface)** on page 3236
 - **clear mac address-table notification mac-change** on page 3237
 - **debug snmp** on page 3238
 - **mac address-table notification mac-change** on page 3240
 - **mac address-table notification mac-change history-size** on page 3241
 - **mac address-table notification mac-change interval** on page 3242
 - **mac address-table notification mac-threshold** on page 3243
 - **show counter snmp-server** on page 3245
 - **show debugging snmp** on page 3250
 - **show mac address-table notification mac-change** on page 3251
 - **show running-config snmp** on page 3254
 - **show snmp-server** on page 3255
 - **show snmp-server community** on page 3256
 - **show snmp-server group** on page 3257
 - **show snmp-server trap** on page 3258
 - **show snmp-server user** on page 3259
 - **show snmp-server view** on page 3260
 - **snmp trap link-status** on page 3261
 - **snmp trap link-status suppress** on page 3263
 - **snmp trap mac-change** on page 3265
 - **snmp-server** on page 3267
 - **snmp-server community** on page 3269
 - **snmp-server contact** on page 3271
 - **snmp-server enable trap** on page 3272
 - **snmp-server engineID local** on page 3277
 - **snmp-server engineID local reset** on page 3279
 - **snmp-server group** on page 3280
 - **snmp-server host** on page 3282
 - **snmp-server legacy-ifadminstatus** on page 3285
 - **snmp-server location** on page 3286
 - **snmp-server source-interface** on page 3287
 - **snmp-server startup-trap-delay** on page 3288
 - **snmp-server system-name** on page 3289
 - **snmp-server user** on page 3290
 - **snmp-server view** on page 3293

- **test snmp trap snmp** on page 3294
- **undebug snmp** on page 3295

Introduction

Overview This chapter provides an alphabetical reference for commands used to configure SNMP. For more information, see:

- the [Support for Allied Telesis Enterprise MIBs in AlliedWare Plus](#), for information about which MIB objects are supported.
- the [SNMP Feature Overview and Configuration Guide](#).

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

alias (interface)

Overview Use this command to set an alias name for a port, as returned by the SNMP ifMIB in OID 1.3.6.1.2.1.31.1.1.18.

Use the **no** variant of this command to remove an alias name from a port.

Syntax alias <ifAlias>
no alias

Parameter	Description
<ifAlias>	64 character name for an interface in a network management system. All printable characters are valid.

Default Not set.

Mode Interface Configuration

Usage notes The interface alias can also be set via SNMP.
Third-party management systems often use standard MIBs to access device information. Network managers can specify an alias interface name to provide a non-volatile way to access the interface.

Example To configure the alias interface name 'uplink_a' for port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# alias uplink_a
```

To remove an alias interface name from port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no alias
```

Command changes Version 5.4.8-2.1: command added

clear mac address-table notification mac-change

Overview Use this command to clear the MAC address table change history and counters. This command clears the change history and resets the counters to zero.

Syntax clear mac address-table notification mac-change

Mode User Exec

Example To clear the MAC address table change history and counters, use the command:

```
awplus# clear mac address-table notification mac-change
```

Related commands [mac address-table notification mac-change interval](#)
[mac address-table notification mac-change history-size](#)
[show mac address-table notification mac-change](#)
[snmp trap mac-change](#)

Command changes Version 5.5.1-2.1: command added

debug snmp

Overview This command enables SNMP debugging.

The **no** variant of this command disables SNMP debugging.

Syntax debug snmp [all|detail|error-string|process|receive|send|xdump]
no debug snmp [all|detail|error-string|process|receive|send|xdump]

Parameter	Description
all	Enable or disable the display of all SNMP debugging information.
detail	Enable or disable the display of detailed SNMP debugging information.
error-string	Enable or disable the display of debugging information for SNMP error strings.
process	Enable or disable the display of debugging information for processed SNMP packets.
receive	Enable or disable the display of debugging information for received SNMP packets.
send	Enable or disable the display of debugging information for sent SNMP packets.
xdump	Enable or disable the display of hexadecimal dump debugging information for SNMP packets.

Mode Privileged Exec and Global Configuration

Example To start SNMP debugging, use the command:

```
awplus# debug snmp
```

To start SNMP debugging, showing detailed SNMP debugging information, use the command:

```
awplus# debug snmp detail
```

To start SNMP debugging, showing all SNMP debugging information, use the command:

```
awplus# debug snmp all
```

Related **show debugging snmp**
commands **terminal monitor**
undebug snmp

mac address-table notification mac-change

Overview Use this command to enable the mac-change history table. You also need to use the command **snmp trap mac-change** to set up the trap and **snmp-server enable trap** to enable the trap for transmission.

Use the **no** variant of this command to disable the mac-change history table.

Syntax mac address-table notification mac-change
no mac address-table notification mac-change

Default Disabled

Mode Global Configuration

Usage notes To set up the mac-change trap use the command:

- **snmp trap mac-change**

To enable transmission of the mac-change trap, specify the parameter **mac-change**, use the command:

- **snmp-server enable trap**

Example To enable the mac-change history table, use the commands:

```
awplus# configure terminal
awplus(config)# mac address-table notification mac-change
```

Related commands **clear mac address-table notification mac-change**
mac address-table notification mac-change history-size
mac address-table notification mac-change interval
mac address-table notification mac-threshold
show mac address-table notification mac-change
snmp-server enable trap
snmp trap mac-change

Command changes Version 5.5.1-2.1: command added

mac address-table notification mac-change history-size

Overview Use this command to set the MAC address table history size to an upper limit on the number of entries that the SNMP table may contain.

Use the **no** variant of this command to set the history size back to the default (1).

Syntax mac address-table notification mac-change history-size <0-500>
no mac address-table notification mac-change history-size

Parameter	Description
<0-500>	Set the upper limit on the number of entries that the SNMP MAC address table may contain.

Default Table size is set at 1 entry.

Mode Global Configuration

Usage notes If the mac-change history table is not enabled, then the history size is stored for when it is enabled.

To enable the mac-change history table, use the command:

- **mac address-table notification mac-change**

Example To configure the size of the MAC change history table to 40, use the commands:

```
awplus# configure terminal
awplus(config)# mac address-table notification mac-change
history-size 40
```

Related commands

- clear mac address-table notification mac-change**
- mac address-table notification mac-change**
- mac address-table notification mac-change interval**
- mac address-table notification mac-threshold**
- show mac address-table notification mac-change**
- snmp trap mac-change**

Command changes Version 5.5.1-2.1: command added

mac address-table notification mac-change interval

Overview Use this command to set the maximum time that a MAC change SNMP notification is delayed in the MAC address table.

Use the **no** variant of this command to set the interval back to the default (1).

Syntax `mac address-table notification mac-change interval`
`<0-2147483647>`
`no mac address-table notification mac-change interval`

Parameter	Description
<code><0-2147483647></code>	Set the interval in seconds.

Default Interval is set at 1 second.

Mode Global Configuration

Usage notes If the mac-change history table is not enabled, then the interval is stored for when it is enabled.

To enable the mac-change history table, use the command:

- **mac address-table notification mac-change**

Example To configure an interval of 5 seconds for the time between two MAC change SNMP notifications being sent, use the commands:

```
awplus# configure terminal
awplus(config)# mac address-table notification mac-change
interval 5
```

Related commands

- clear mac address-table notification mac-change**
- mac address-table notification mac-change**
- mac address-table notification mac-change history-size**
- mac address-table notification mac-threshold**
- show mac address-table notification mac-change**
- snmp trap mac-change**

Command changes Version 5.5.1-2.1: command added

mac address-table notification mac-threshold

Overview Use this command to change the default interval and threshold values for storing and sending Layer 2 forwarding database (FDB) utilization information. These settings are stored in the running configuration.

Use the **no** variant of this command to set the threshold configuration back to the default.

Syntax `mac address-table notification mac-threshold {interval <120-214783647>|limit <0-100>}`
`no mac address-table notification mac-threshold`

Parameter	Description
interval	Change the default interval value. The interval value controls the interval between utilization checks.
<120-214783647>	Set the interval in seconds.
limit	Change the limit value. When this limit is reached, an SNMP trap is sent.
<0-100>	Set the limit as a percentage.

Default Interval default is 120 seconds and the limit default is 50 percent.

Mode Global Configuration

Usage notes To enable transmission of the mac-threshold trap, specify the parameter **mac-threshold**, use the command:

- **snmp-server enable trap**

Example To configure the MAC threshold notifications to be sent if the L2 FDB table utilization is more than or equal to 70%, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# mac address-table notification mac-threshold  
limit 70
```

To set the MAC threshold notifications interval and limit back to default values, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# no mac address-table notification mac-threshold
```

Related commands **show running-config**
snmp-server enable trap

Command changes Version 5.5.1-2.1: command added

show counter snmp-server

Overview This command displays counters for SNMP messages received by the SNMP agent.

Syntax show counter snmp-server

Mode User Exec and Privileged Exec

Example To display the counters for the SNMP agent, use the command:
awplus# show counter snmp-server

Output The following shows typical output.

Example output from the show counter snmp-server command

SNMP-SERVER counters	
inPkts	11
inBadVersions	0
inBadCommunityNames	0
inBadCommunityUses	0
inASNParseErrs	0
inTooBig	0
inNoSuchNames	0
inBadValues	0
inReadOnly	0
inGenErrs	0
inTotalReqVars	9
inTotalSetVars	0
inGetRequests	2
inGetNexts	9
inSetRequests	0
inGetResponses	0
inTraps	0
outPkts	11
outTooBig	0
outNoSuchNames	2
outBadValues	0
outGenErrs	0
outGetRequests	0
outGetNexts	0
outSetRequests	0
outGetResponses	11
outTraps	0
UnsupportedSecLevels	0
NotInTimeWindows	0
UnknownUserNames	0
UnknownEngineIDs	0
WrongDigest	0
DecryptionErrors	0
UnknownSecModels	0
InvalidMsgs	0
UnknownPDUHandlers	0

Parameters in the output of the show counter snmp-server command

Parameter	Meaning
inPkts	The total number of SNMP messages received by the SNMP agent.
inBadVersions	The number of messages received by the SNMP agent for an unsupported SNMP version. It drops these messages. The SNMP agent on your device supports versions 1, 2C, and 3.
inBadCommunityNames	The number of messages received by the SNMP agent with an unrecognized SNMP community name. It drops these messages.
inBadCommunityUses	The number of messages received by the SNMP agent where the requested SNMP operation is not

Parameter	Meaning
	permitted from SNMP managers using the SNMP community named in the message.
inASNParseErrs	The number of ASN.1 or BER errors that the SNMP agent has encountered when decoding received SNMP Messages.
inTooBigs	The number of SNMP PDUs received by the SNMP agent where the value of the error-status field is 'tooBig'. This is sent by an SNMP manager to indicate that an exception occurred when processing a request from the agent.
inNoSuchNames	The number of SNMP PDUs received by the SNMP agent where the value of the error-status field is 'noSuchName'. This is sent by an SNMP manager to indicate that an exception occurred when processing a request from the agent.
inBadValues	The number of SNMP PDUs received by the SNMP agent where the value of the error-status field is 'badValue'. This is sent by an SNMP manager to indicate that an exception occurred when processing a request from the agent.
inReadOnlyls	The number of valid SNMP PDUs received by the SNMP agent where the value of the error-status field is 'readOnly'. The SNMP manager should not generate a PDU which contains the value 'readOnly' in the error- status field. This indicates that there is an incorrect implementations of the SNMP.
inGenErrs	The number of SNMP PDUs received by the SNMP agent where the value of the error-status field is 'genErr'.
inTotalReqVars	The number of MIB objects that the SNMP agent has successfully retrieved after receiving valid SNMP Get-Request and Get-Next PDUs.
inTotalSetVars	The number of MIB objects that the SNMP agent has successfully altered after receiving valid SNMP Set- Request PDUs.
inGetRequests	The number of SNMP Get-Request PDUs that the SNMP agent has accepted and processed.
inGetNexts	The number of SNMP Get-Next PDUs that the SNMP agent has accepted and processed.
inSetRequests	The number of SNMP Set-Request PDUs that the SNMP agent has accepted and processed.

Parameter	Meaning
inGetResponses	The number of SNMP Get-Response PDUs that the SNMP agent has accepted and processed.
inTraps	The number of SNMP Trap PDUs that the SNMP agent has accepted and processed.
outPkts	The number of SNMP Messages that the SNMP agent has sent.
outTooBigs	The number of SNMP PDUs that the SNMP agent has generated with the value 'tooBig' in the error-status field. This is sent to the SNMP manager to indicate that an exception occurred when processing a request from the manager.
outNoSuchNames	The number of SNMP PDUs that the SNMP agent has generated with the value 'noSuchName' in the error-status field. This is sent to the SNMP manager to indicate that an exception occurred when processing a request from the manager.
outBadValues	The number of SNMP PDUs that the SNMP agent has generated with the value 'badValue' in the error-status field. This is sent to the SNMP manager to indicate that an exception occurred when processing a request from the manager.
outGenErrs	The number of SNMP PDUs that the SNMP agent has generated with the value 'genErr' in the error-status field. This is sent to the SNMP manager to indicate that an exception occurred when processing a request from the manager.
outGetRequests	The number of SNMP Get-Request PDUs that the SNMP agent has generated.
outGetNexts	The number of SNMP Get-Next PDUs that the SNMP agent has generated.
outSetRequests	The number of SNMP Set-Request PDUs that the SNMP agent has generated.
outGetResponses	The number of SNMP Get-Response PDUs that the SNMP agent has generated.
outTraps	The number of SNMP Trap PDUs that the SNMP agent has generated.
UnsupportedSecLevels	The number of received packets that the SNMP agent has dropped because they requested a securityLevel unknown or not available to the SNMP agent.
NotInTimeWindows	The number of received packets that the SNMP agent has dropped because they appeared

Parameter	Meaning
	outside of the authoritative SNMP agent's window.
UnknownUserNames	The number of received packets that the SNMP agent has dropped because they referenced an unknown user.
UnknownEngineIDs	The number of received packets that the SNMP agent has dropped because they referenced an unknown snmpEngineID.
WrongDigest	The number of received packets that the SNMP agent has dropped because they didn't contain the expected digest value.
DecryptionErrors	The number of received packets that the SNMP agent has dropped because they could not be decrypted.
UnknownSecModels	The number of messages received that contain a security model that is not supported by the server. Valid for SNMPv3 messages only.
InvalidMsgs	The number of messages received where the security model is supported but the authentication fails. Valid for SNMPv3 messages only.
UnknownPDUHandlers	The number of times the SNMP handler has failed to process a PDU. This is a system debugging counter.

Related [show snmp-server](#)
commands

show debugging snmp

Overview This command displays whether SNMP debugging is enabled or disabled.

Syntax show debugging snmp

Mode User Exec and Privileged Exec

Example To display the status of SNMP debugging, use the command:

```
awplus# show debugging snmp
```

Output The following shows typical output.

Example output from the show debugging snmp command

```
Sntp (SMUX) debugging status:  
Sntp debugging is on
```

Related commands [debug snmp](#)

show mac address-table notification mac-change

Overview Use this command to show the MAC change configuration. It includes the MAC change history.

Syntax show mac address-table notification mac-change

Mode User Exec

Example To show the MAC change configuration and history, use the command:
awplus# show mac address-table notification mac-change

Output The following shows typical output.

Example output from show mac address-table notification mac-change

```
awplus#show mac address-table notification mac-change
MAC Change Feature: Enabled
MAC Change Notification Traps: Enabled
Wait time for MAC Change Notification Traps: 1 seconds
Number of MAC Address Add events: 1
Number of MAC Address Remove events: 0
Number of MAC Change Notification Traps sent: 1
Maximum Number of entries configured in History Table: 1
Number of entries currently in History Table: 1
History Table contents
-----
History Index 1, Timestamp(uptime) 0 days 00:39:25 (236500)
MAC Change message:
  Operation: Added   Vlan: 2       MAC Addr: 000d.b950.0c26
  Dot1dBasePort: 2
```

Parameters in the output from show mac address-table notification mac-change

Parameter	Description
MAC Change Feature	Displays if the feature is enabled or not. If this is disabled, then no more MAC change events will be generated, no events are added to the history, and no traps are logged.
MAC Change Notification Traps	Displays if MAC change traps are sent when MAC change events are generated. This only affects traps, (MAC change history is not affected).
Wait time for MAC Change Notification Traps	The maximum time a MAC change event waits before a MAC change trap is sent. This is also the maximum time a MAC change event waits before being added to the MAC change history. The time is in seconds.
Number of MAC Address Add events	The number of MAC-added events processed by the feature.
Number of MAC Address Remove events	The number of MAC-removed events processed by the feature.
Number of MAC Change Notification Traps sent	The number of MAC notification traps sent by the feature.
Maximum Number of entries configured in History Table	The maximum number of entries present in the MAC change table.

Related commands [clear mac address-table notification mac-change](#)
[mac address-table notification mac-change](#)

Command changes Version 5.5.1-2.1: command added

show running-config snmp

Overview This command displays the current configuration of SNMP on your device.

Syntax show running-config snmp

Mode Privileged Exec

Example To display the current configuration of SNMP on your device, use the command:

```
awplus# show running-config snmp
```

Output The following shows typical output.

Example output from the show running-config snmp command

```
snmp-server contact AlliedTelesis
snmp-server location Philippines
snmp-server group grou1 auth read view1 write view1 notify view1
snmp-server view view1 1 included
snmp-server community public
snmp-server user user1 group1 auth md5 password priv des
password
```

Related commands [show snmp-server](#)

show snmp-server

Overview This command displays the status and current configuration of the SNMP server.

Syntax show snmp-server

Mode Privileged Exec

Example To display the status of the SNMP server, use the command:
awplus# show snmp-server

Output The following shows typical output.

Example output from the show snmp-server command

```
SNMP Server ..... Enabled
IP Protocol ..... IPv4
SNMPv3 Engine ID (configured name) ... Not set
SNMPv3 Engine ID (actual) ..... 0x80001f888021338e4747b8e607
```

Related commands

- [debug snmp](#)
- [show counter snmp-server](#)
- [snmp-server](#)
- [snmp-server engineID local](#)
- [snmp-server engineID local reset](#)

show snmp-server community

Overview This command displays the SNMP server communities configured on the device. SNMP communities are specific to v1 and v2c.

Syntax show snmp-server community

Mode Privileged Exec

Example To display the SNMP server communities, use the command:
awplus# show snmp-server community

Output The following shows typical output.

Example output from the show snmp-server community command

```
SNMP community information:
Community Name ..... public
Access ..... Read-only
View ..... none
```

Related commands [show snmp-server](#)
[snmp-server community](#)

show snmp-server group

Overview This command displays information about SNMP server groups. This command is used with SNMP version 3 only.

Syntax show snmp-server group

Mode Privileged Exec

Example To display the SNMP groups configured on the device, use the command:
awplus# show snmp-server group

Output The following shows typical output.

Example output from the show snmp-server group command

```
SNMP group information:
  Group name ..... guireadgroup
  Security Level ..... priv
  Read View ..... guiview
  Write View ..... none
  Notify View ..... none

  Group name ..... guiwritegroup
  Security Level ..... priv
  Read View ..... none
  Write View ..... guiview
  Notify View ..... none
```

Related commands [show snmp-server](#)
[snmp-server group](#)

show snmp-server trap

Overview Use this command to display the status of the SNMP traps.

Syntax show snmp-server trap

Mode Privileged Exec

Example To display the SNMP traps status, use the commands:

```
awplus# show snmp-server trap
```

Output The following shows typical output.

Example output from: show snmp-server trap

```
awplus#show snmp-server trap
ATMF traps ..... Disabled
ATMF Link traps ..... Disabled
ATMF Node traps ..... Disabled
ATMF Guest Node traps ..... Enabled
ATMF Reboot Rolling traps ..... Disabled
Authentication failure ..... Disabled
BGP traps ..... Disabled
CWM Access Point traps ..... Enabled
DHCP Snooping traps ..... Disabled
EPSR traps ..... Disabled
LLDP traps ..... Disabled
Loop Protection traps ..... Disabled
MSTP traps ..... Disabled
NSM traps ..... Disabled
OSPF traps ..... Disabled
PIM traps ..... Disabled
Power-inline traps ..... Disabled
QoS Storm Protection traps ..... Enabled
RMON traps ..... Disabled
MAC address Thrash Limiting traps .... Disabled
UDLD traps ..... Disabled
VCS traps ..... Disabled
VRRP traps ..... Disabled
MRP traps ..... Enabled
Wireless traps ..... Disabled
```

Related commands [show snmp-server](#)
[snmp-server enable trap](#)

show snmp-server user

Overview This command displays the SNMP server users and is used with SNMP version 3 only.

Syntax show snmp-server user

Mode Privileged Exec

Example To display the SNMP server users configured on the device, use the command:

```
awplus# show snmp-server user
```

Output The following shows typical output.

Example output from the show snmp-server user command

Name	Group name	Auth	Privacy
-----	-----	-----	-----
freddy	guireadgroup	none	none

Related commands [show snmp-server](#)
[snmp-server user](#)

show snmp-server view

Overview This command displays the SNMP server views and is used with SNMP version 3 only.

Syntax show snmp-server view

Mode Privileged Exec

Example To display the SNMP server views configured on the device, use the command:

```
awplus# show snmp-server view
```

Output The following shows typical output.

Example output from the show snmp-server view command

```
SNMP view information:
View Name ..... view1
OID ..... 1
Type ..... included
```

Related commands [show snmp-server](#)
[snmp-server view](#)

snmp trap link-status

Overview Use this command to enable SNMP to send link status notifications (traps) for the interfaces when an interface goes up (linkUp) or down (linkDown). Use the **no** variant of this command to disable the sending of link status notifications.

Syntax snmp trap link-status [enterprise]
no snmp trap link-status

Parameter	Description
enterprise	Send an Allied Telesis enterprise type of link trap.

Default Disabled

Mode Interface Configuration

Usage notes The link status notifications can be enabled for the following interface types:

- switch port (e.g. port1.0.1)
- VLAN (e.g. vlan2)
- static and dynamic link aggregation (e.g. sa2, po2)

To specify where notifications are sent, use the **snmp-server host** command. To configure the device globally to send other notifications, use the **snmp-server enable trap** command.

Examples To enable SNMP to send link status notifications for port1.0.1 to port1.0.3 use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.3
awplus(config-if)# snmp trap link-status
```

To disable the sending of link status notifications for port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no snmp trap link-status
```

Related commands [show interface](#)
[snmp trap link-status suppress](#)
[snmp-server enable trap](#)
[snmp-server host](#)

snmp trap link-status suppress

Overview Use this command to enable the suppression of link status notifications (traps) for the interfaces beyond the specified threshold, in the specified interval.

Use the **no** variant of this command to disable the suppression of link status notifications for the ports.

Syntax `snmp trap link-status suppress {time {<1-60>|default}}|threshold {<1-20>|default}}`
`no snmp trap link-status suppress`

Parameter	Description
time	Set the suppression timer for link status notifications.
<1-60>	The suppress time in seconds.
default	The default suppress time in seconds (60).
threshold	Set the suppression threshold for link status notifications. This is the number of link status notifications after which to suppress further notifications within the suppression timer interval.
<1-20>	The number of link status notifications.
default	The default number of link status notifications (20).

Default By default, if link status notifications are enabled (they are enabled by default), the suppression of link status notifications is enabled: notifications that exceed the notification threshold (default 20) within the notification timer interval (default 60 seconds) are not sent.

Mode Interface Configuration

Usage notes An unstable network can generate many link status notifications. When notification suppression is enabled, a suppression timer is started when the first link status notification of a particular type (linkUp or linkDown) is sent for an interface.

If the threshold number of notifications of this type is sent before the timer reaches the suppress time, any further notifications of this type generated for the interface during the interval are not sent. At the end of the interval, the sending of link status notifications resumes, until the threshold is reached in the next interval.

Examples To suppress link status notifications for port1.0.1 to port1.0.3 after 10 notifications in 40 seconds, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1-port1.0.3
awplus(config-if)# snmp trap link-status suppress time 40
threshold 10
```

To stop suppressing link status notifications for port1.0.1, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no snmp trap link-status suppress
```

Related commands [show interface](#)
[snmp trap link-status](#)

snmp trap mac-change

Overview Use this command to enable the MAC notification feature to apply mac-change notifications via the mac-change trap. This command configures the trap so that you are notified when MAC addresses are added or removed from the forwarding database (FDB). This is applied to interfaces via a specified port or a range of ports.

Use the **no** variant of this command to disable the MAC notification feature.

Syntax snmp trap mac-change {[add] [remove]}
no snmp trap mac-change [add] [remove]

Parameter	Description
add	Enable SNMP mac-change traps when a MAC address is added.
remove	Enable SNMP mac-change traps when a MAC address is removed.

Default Disabled

Mode Interface Configuration

Usage notes To enable transmission of the mac-change trap, specify the parameter **mac-change**, use the command:

- **snmp-server enable trap**

To enable the mac-change history table, use the command:

- **mac address-table notification mac-change**

Example To get mac-change notifications whenever a MAC address associated with port1.0.1 is added or removed from the FDB table, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# snmp trap mac-change add remove
```

Related commands **clear mac address-table notification mac-change**
mac address-table notification mac-change
show interface
snmp-server enable trap

Command changes Version 5.5.1-2.1: command added

snmp-server

Overview Use this command to enable the SNMP agent (server) on the device. The SNMP agent receives and processes SNMP packets sent to the device, and generates notifications (traps) that have been enabled by the **snmp-server enable trap**.

Use the **no** variant of this command to disable the SNMP agent on the device. When SNMP is disabled, SNMP packets received by the device are discarded, and no notifications are generated. This does not remove any existing SNMP configuration.

Syntax snmp-server [ip|ipv6]
no snmp-server [ip|ipv6]

Parameter	Description
ip	Enable or disable the SNMP agent for IPv4.
ipv6	Enable or disable the SNMP agent for IPv6.

Default By default, the SNMP agent is enabled for both IPv4 and IPv6. If neither the **ip** parameter nor the **ipv6** parameter is specified for this command, then SNMP is enabled or disabled for both IPv4 and IPv6.

Mode Global Configuration

Examples To enable SNMP on the device for both IPv4 and IPv6, use the commands:

```
awplus# configure terminal
awplus(config)# snmp-server
```

To enable the SNMP agent for IPv4 on the device, use the commands:

```
awplus# configure terminal
awplus(config)# snmp-server ip
```

To disable the SNMP agent for both IPv4 and IPv6 on the device, use the commands:

```
awplus# configure terminal
awplus(config)# no snmp-server
```

To disable the SNMP agent for IPv4, use the commands:

```
awplus(config)# no snmp-server ipv4
```

Related commands

- show snmp-server**
- show snmp-server community**
- show snmp-server user**
- snmp-server community**
- snmp-server contact**
- snmp-server enable trap**
- snmp-server engineID local**
- snmp-server group**
- snmp-server host**
- snmp-server location**
- snmp-server view**

snmp-server community

Overview This command creates an SNMP community, optionally setting the access mode for the community. The default access mode is read-only. If the view parameter is not specified, the community allows access to all the MIB objects. The SNMP communities are only valid for SNMPv1 and v2c and provide very limited security. Communities should not be used when operating SNMPv3.

The **no** variant of this command removes an SNMP community. The specified community must already exist on the device.

Syntax `snmp-server community <community-name> [view <view-name>|ro|rw|<access-list>]`
`no snmp-server community <community-name>`

Parameter	Description
<community-name>	Community name. The community name is a case sensitive string of up to 20 characters.
view	Configure SNMP view. If view is not specified, the community allows access to all the MIB objects.
<view-name>	View name. The view name is a string up to 20 characters long and is case sensitive.
ro	Read-only community.
rw	Read-write community.
<access-list>	<1-99> Access list number. Warning: Do not use an ACL with deny rules. This is because only permit rules are applied.

Default The default access mode is Read-only.

Mode Global Configuration

Example Use the following commands to create an SNMP community called 'public' with read-only access to all MIB variables from any management station:

```
awplus# configure terminal
```

```
awplus(config)# snmp-server community public ro
```

Use the following commands to remove an SNMP community called 'public'

```
awplus# configure terminal
```

```
awplus(config)# no snmp-server community public
```

Related **show snmp-server**
commands **show snmp-server community**
snmp-server view

snmp-server contact

Overview This command sets the contact information for the system. The contact name is:

- displayed in the output of the **show system** command
- stored in the MIB object sysContact

The **no** variant of this command removes the contact information from the system.

Syntax snmp-server contact <contact-info>
no snmp-server contact

Parameter	Description
<contact-info>	The contact information for the system, from 0 to 255 characters long. Valid characters are any printable character and spaces.

Mode Global Configuration

Example To set the system contact information to "example@example.com", use the command:

```
awplus# configure terminal
awplus(config)# snmp-server contact example@example.com
```

Related commands **show system**
snmp-server location
snmp-server system-name
snmp-server group

snmp-server enable trap

Overview Use this command to enable the transmission of the specified notifications (traps) on your device.

Note that the Environmental Monitoring traps defined in the AT-ENVMONv2-MIB are enabled by default.

Use the **no** variant of this command to disable the transmission of the specified notifications.

Syntax snmp-server enable trap <trap-list>
no snmp-server enable trap <trap-list>

Depending on your device model, you can enable some or all of the traps in the following table:

Parameter	Description
atmf	AMF traps.
atmfguestnode	AMF guest node traps.
atmflink	AMF link traps.
atmfnode	AMF node traps.
atmfrr	AMF reboot-rolling traps.
auth	Authentication failure.
bgp	BGP traps.
chassis	Chassis traps.
cwmap	Access Point traps with the AWC wireless manager.
dhcpsnooping	DHCP snooping and ARP security traps. These notifications must also be set using the ip dhcp snooping violation command, and/or the arp security violation command.
epsr	EPSR traps.
g8032	G.8032 ERP traps.
lldp	Link Layer Discovery Protocol (LLDP) traps. These notifications must also be enabled using the lldp notifications command, and/or the lldp med-notifications command.
loopprot	Loop Protection traps.
low-memory	Traps that are generated when available memory drops beneath low, very low, and critical thresholds, and when it returns to normal. The traps are: 1.3.6.1.4.1.207.8.4.4.3.7.0 memoryTraps 1.3.6.1.4.1.207.8.4.4.3.7.0.1 memoryLowTrap 1.3.6.1.4.1.207.8.4.4.3.7.0.2 memoryVeryLowTrap 1.3.6.1.4.1.207.8.4.4.3.7.0.3 memoryCriticalTrap (However, note that when the system reaches the critical memory threshold, it reboots before a trap can be sent.) 1.3.6.1.4.1.207.8.4.4.3.7.0.4 memoryReturnToNormalTrap

Parameter	Description
	1.3.6.1.4.1.207.8.4.4.3.7.0.5 vcstackId
mac-change	MAC address changed.
mac-move	MAC address moved between interface.
mac-threshold	MAC address table reaches a threshold limit.
mstp	MSTP traps.
nsm	NSM traps.
ospf	OSPF traps.
pim	PIM traps.
power-inline	Power-inline traps (Power Ethernet MIB RFC 3621).
qsp	QoS Storm Protection.
rmon	RMON traps.
thrash-limit	MAC address Thrash Limiting traps.
vcs	VCS traps. Note that to see VCS resiliency link traps, you have to use the vcs-resiliency-link parameter too, as shown below.
vcs vcs-resiliency-link	VCS resiliency link traps. You will only see these traps if you enter both vcs and vcs-resiliency-link .
vrrp	Virtual Router Redundancy (VRRP) traps.
ufo	Upstream Forwarding Only (UFO) traps.

Default Disabled

Mode Global Configuration

Usage notes This command cannot be used to enable link status notifications globally. To enable link status notifications for particular interfaces, use the **snmp trap link-status** command.

To specify where notifications are sent, use the **snmp-server host** command.

Note that you can enable (or disable) multiple traps with a single command, by specifying a space-separated list of traps.

Examples To enable the device to send a notification if an AMF node changes its status, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap atmfnode
```

To enable the device to send PoE related traps, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap power-inline
```

To disable PoE traps being sent out by the device, use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server enable trap power-inline
```

To enable the device to send MAC address Thrash Limiting traps, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap thrash-limit
```

To disable the device from sending MAC address Thrash Limiting traps, use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server enable trap thrash-limit
```

To enable the device to send OSPF and VRRP-related traps, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server enable trap ospf vrrp
```

To disable OSPF traps being sent out by the device, use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server enable trap ospf
```

Related commands

- show snmp-server**
- show ip dhcp snooping**
- snmp trap link-status**
- snmp-server host**
- trap (g8032-switch)**
- private-vlan ufo trap**

Command changes Version 5.5.4-2.3: **low-memory** parameter added
Version 5.5.4-0.1: **vcs vcs-resiliency-link** parameter added
Version 5.5.1-2.1: **mac-change**, **mac-move**, and **mac-threshold** parameters added
Version 5.5.1-1.1: **atmfguestnode** and **cwmap** parameters added
Version 5.4.7-2.1: **ufo** parameter added

snmp-server engineID local

Overview Use this command to configure the SNMPv3 engine ID. The SNMPv3 engine ID is used to uniquely identify the SNMPv3 agent on a device when communicating with SNMP management clients. Once an SNMPv3 engine ID is assigned, this engine ID is permanently associated with the device until you change it.

Use the **no** variant of this command to set the user defined SNMPv3 engine ID to a system generated pseudo-random value by resetting the SNMPv3 engine. The **no snmp-server engineID local** command has the same effect as the **snmp-server engineID local default** command.

Note that the **snmp-server engineID local reset** command is used to force the system to generate a new engine ID when the current engine ID is also system generated.

Syntax snmp-server engineID local {<engine-id>|default}
no snmp-server engineID local

Parameter	Description
<engine-id>	Specify SNMPv3 Engine ID value, a string of up to 27 characters.
default	Set SNMPv3 engine ID to a system generated value by resetting the SNMPv3 engine, provided the current engine ID is user defined. If the current engine ID is system generated, use the snmp-server engineID local reset command to force the system to generate a new engine ID.

Mode Global Configuration

Usage notes All devices must have a unique engine ID which is permanently set unless it is configured by the user.

Example To set the SNMPv3 engine ID to 800000cf030000cd123456, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server engineID local
800000cf030000cd123456
```

To set a user defined SNMPv3 engine ID back to a system generated value, use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server engineID local
```

Output The following example shows the engine ID values after configuration:

```
awplus(config)#snmp-server engineid local asdgdfh231234d
awplus(config)#exit
awplus#show snmp-server

SNMP Server ..... Enabled
IP Protocol ..... IPv4
SNMPv3 Engine ID (configured name) ... asdgdfh231234d
SNMPv3 Engine ID (actual) ..... 0x80001f888029af52e149198483

awplus(config)#no snmp-server engineid local
awplus(config)#exit
awplus#show snmp-server

SNMP Server ..... Enabled
IP Protocol ..... IPv4
SNMPv3 Engine ID (configured name) ... Not set
SNMPv3 Engine ID (actual) ..... 0x80001f888029af52e149198483
```

Related commands [show snmp-server](#)
[snmp-server engineID local reset](#)
[snmp-server group](#)

snmp-server engineID local reset

Overview Use this command to force the device to generate a new pseudo-random SNMPv3 engine ID by resetting the SNMPv3 engine. If the current engine ID is user defined, use the **snmp-server engineID local** command to set SNMPv3 engine ID to a system generated value.

Syntax snmp-server engineID local reset

Mode Global Configuration

Example To force the SNMPv3 engine ID to be reset to a system generated value, use the commands:

```
awplus# configure terminal
awplus(config)# snmp-server engineID local reset
```

Related commands **snmp-server engineID local**
show snmp-server

snmp-server group

Overview This command is used with SNMP version 3 only, and adds an SNMP group, optionally setting the security level and view access modes for the group. The security and access views defined for the group represent the minimum required of its users in order to gain access.

The **no** variant of this command deletes an SNMP group, and is used with SNMPv3 only. The group with the specified authentication/encryption parameters must already exist.

Syntax `snmp-server group <groupname> {auth|noauth|priv} [read <readname>|write <writename>|notify <notifysname>]`
`no snmp-server group <groupname>`

Parameter	Description
<groupname>	Group name. The group name is a string up to 20 characters long and is case sensitive.
auth	Authentication.
noauth	No authentication and no encryption.
priv	Authentication and encryption.
read	Configure read view.
<readname>	Read view name.
write	Configure write view.
<writename>	Write view name. The view name is a string up to 20 characters long and is case sensitive.
notify	Configure notify view.
<notifysname>	Notify view name. The view name is a string up to 20 characters long and is case sensitive.

Mode Global Configuration

Examples To add SNMP group, for ordinary users, use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# snmp-server group usergroup noauth read  
useraccess write useraccess
```

To delete the SNMP group called 'usergroup', use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# no snmp-server group usergroup
```

Related commands

- snmp-server**
- show snmp-server**
- show snmp-server group**
- show snmp-server user**

snmp-server host

Overview This command specifies an SNMP trap host destination to which Trap or Inform messages generated by the device are sent.

For SNMP version 1 and 2c you must specify the community name parameter. For SNMP version 3, specify the authentication/encryption parameters and the user name. If the version is not specified, the default is SNMP version 1. Inform messages can be sent instead of traps for SNMP version 2c and 3.

Use the **no** variant of this command to remove an SNMP trap host. The trap host must already exist.

The trap host is uniquely identified by:

- host IP address (IPv4 or IPv6)
- inform or trap messages
- community name (SNMPv1 or SNMP v2c) or the authentication/encryption parameters and user name (SNMP v3).

Syntax `snmp-server host {<ipv4-address>|<ipv6-address>} [traps]
[version 1] <community-name>`
`snmp-server host {<ipv4-address>|<ipv6-address>} [informs|traps]
version 2c <community-name>`
`snmp-server host {<ipv4-address>|<ipv6-address>} [informs|traps]
version 3 {auth|noauth|priv} <user-name>`
`no snmp-server host {<ipv4-address>|<ipv6-address>} [traps]
[version 1] <community-name>`
`no snmp-server host {<ipv4-address>|<ipv6-address>} [informs|
traps] version 2c <community-name>`
`no snmp-server host {<ipv4-address>|<ipv6-address>} [informs|
traps] version 3 {auth|noauth|priv} <user-name>`

Parameter	Description
<i><ipv4-address></i>	IPv4 trap host address in the format A.B.C.D, for example, 192.0.2.2.
<i><ipv6-address></i>	IPv6 trap host address in the format x:x::x:x for example, 2001:db8::8a2e:7334.
informs	Send Inform messages to this host.
traps	Send Trap messages to this host (default).
version	SNMP version to use for notification messages. Default: version 1.
1	Use SNMPv1 (default).
2c	Use SNMPv2c.
3	Use SNMPv3.
auth	Authentication.
noauth	No authentication.
priv	Encryption.
<i><community-name></i>	The SNMPv1 or SNMPv2c community name.
<i><user-name></i>	SNMPv3 user name.

Default No host is defined.

Mode Global Configuration

Usage notes You can test connectivity to the host by using the command **test snmp trap snmp**.

Examples To configure the device to send generated traps to the IPv4 host destination 192.0.2.5 with the SNMPv2c community name 'public', use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server host 192.0.2.5 version 2c public
```

To configure the device to send generated traps to the IPv6 host destination 2001:db8::8a2e:7334 with the SNMPv2c community name 'private', use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server host 2001:db8::8a2e:7334 version 2c
private
```

To remove a configured trap host of 192.0.2.5 with the SNMPv2c community name 'public', use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server host 192.0.2.5 version 2c public
```

Related commands [snmp trap link-status](#)
[snmp-server enable trap](#)
[snmp-server view](#)
[test snmp trap snmp](#)

Command changes Version 5.5.2-1.1: **vrf** parameter added for products that support VRF

snmp-server legacy-ifadminstatus

Overview Use this command to set the ifAdminStatus to reflect the operational state of the interface, rather than the administrative state.

The **no** variant of this command sets the ifAdminStatus to reflect the administrative state of the interface.

Syntax snmp-server legacy-ifadminstatus
no snmp-server legacy-ifadminstatus

Default Legacy ifAdminStatus is turned off by default, so by default the SNMP ifAdminStatus reflects the administrative state of the interface.

Mode Global Configuration

Usage notes Note that if you enable Legacy ifAdminStatus, the ifAdminStatus will report a link's status as Down when the link has been blocked by a process such as loop protection.

Example To turn on Legacy ifAdminStatus, use the commands:

```
awplus# configure terminal  
awplus(config)# snmp-server legacy-ifadminstatus
```

Related commands [show interface](#)

snmp-server location

Overview This command sets the location of the system. The location is:

- displayed in the output of the **show system** command
- stored in the MIB object sysLocation

The **no** variant of this command removes the configured location from the system.

Syntax snmp-server location <location-name>
no snmp-server location

Parameter	Description
<location-name>	The location of the system, from 0 to 255 characters long. Valid characters are any printable character and spaces.

Mode Global Configuration

Example To set the location to "server room 523", use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server location server room 523
```

Related commands **show snmp-server**
show system
snmp-server contact
snmp-server system-name

snmp-server source-interface

Overview Use this command to specify the originating interface for SNMP traps or informs. An interface specified by this command must already have an IP address assigned to it.

Use the **no** variant of this command to reset the interface to its default value (the originating egress interface).

Syntax `snmp-server source-interface {traps|informs} <interface-name>`
`no snmp-server source-interface {traps|informs}`

Parameter	Description
traps	SNMP traps.
informs	SNMP informs.
<interface-name>	Interface name (must already have an IP address assigned).

Default The originating egress interface of the traps and informs messages

Mode Global Configuration

Usage notes When an SNMP server sends an SNMP trap or inform message, the message carries the notification IP address of its originating interface. Use this command to assign this interface.

Example The following commands set vlan2 to be the interface whose IP address is used as the originating address in SNMP informs packets.

```
awplus# configure terminal
```

```
awplus(config)# snmp-server source-interface informs vlan2
```

The following commands reset the originating source interface for SNMP trap messages to be the default interface (the originating egress interface):

```
awplus# configure terminal
```

```
awplus(config)# no snmp-server source-interface traps
```

Validation Commands **show running-config**

snmp-server startup-trap-delay

Overview Use this command to set the time in seconds after following completion of the device startup sequence before the device sends any SNMP traps (or SNMP notifications).

Use the no variant of this command to restore the default startup delay of 30 seconds.

Syntax snmp-server startup-trap-delay *<delay-time>*
no snmp-server startup-trap-delay

Parameter	Description
<i><delay-time></i>	Specify an SNMP trap delay time in seconds in the range of 30 to 600 seconds.

Default The SNMP server trap delay time is 30 seconds. The no variant restores the default.

Mode Global Configuration

Example To delay the device sending SNMP traps until 60 seconds after device startup, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server startup-trap-delay 60
```

To restore the sending of SNMP traps to the default of 30 seconds after device startup, use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server startup-trap-delay
```

Validation Commands **show snmp-server**

snmp-server system-name

- Overview** Use this command to set the name of the system. The name is stored in the MIB object sysName.
- Note that this command does not set the hostname or change the name in the command prompt. Use the [hostname](#) command to do that.
- Use the **no** variant of this command to remove the system name.

- Syntax** snmp-server system-name <name>
no snmp-server system-name

Parameter	Description
<name>	The name of the system, from 0 to 255 characters long. Valid characters are any printable character and spaces.

- Default** None

- Mode** Global Configuration

- Example** To set the system name to ExampleDevice, use the commands:
- ```
awplus# configure terminal
awplus(config)# snmp-server system-name ExampleDevice
```

- Related commands** [hostname](#)  
[show snmp-server](#)  
[snmp-server contact](#)  
[snmp-server location](#)

- Command changes** Version 5.5.5-2.1: command added

## snmp-server user

**Overview** Use this command to create or move users as members of specified groups. This command is used with SNMPv3 only.

The **no** variant of this command removes an SNMPv3 user. The specified user must already exist.

**Syntax** `snmp-server user <username> <groupname> [encrypted]  
[auth {md5|sha|sha-256} <auth-password>] [priv {des|aes}  
<privacy-password>]  
no snmp-server user <username>`

| Parameter          | Description                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------|
| <username>         | User name. The user name is a string up to 20 characters long and is case sensitive.                |
| <groupname>        | Group name. The group name is a string up to 20 characters long and is case sensitive.              |
| encrypted          | Use the encrypted parameter when you want to enter encrypted passwords.                             |
| auth               | Authentication protocol.                                                                            |
| md5                | MD5 Message Digest Algorithms.                                                                      |
| sha                | SHA Secure Hash Algorithm.                                                                          |
| sha-256            | SHA-256 Secure Hash Algorithm. Note: SHA-256 authentication is required in crypto secure-mode.      |
| <auth-password>    | Authentication password. The password is a string of 8 to 20 characters long and is case sensitive. |
| priv               | Privacy protocol.                                                                                   |
| des                | DES: Data Encryption Standard. DES is not available if you enable <b>crypto secure-mode</b> .       |
| aes                | AES: Advanced Encryption Standards.                                                                 |
| <privacy-password> | Privacy password. The password is a string of 8 to 20 characters long and is case sensitive.        |

**Mode** Global Configuration

**Usage notes** Additionally this command provides the option of selecting an authentication protocol and (where appropriate) an associated password. Similarly, options are offered for selecting a privacy protocol and password.

- Note that each SNMP user must be configured on both the manager and agent entities. Where passwords are used, these passwords must be the same for both entities.
- Use the **encrypted** parameter when you want to enter already encrypted passwords in encrypted form as displayed in the running and startup configs stored on the device. For example, you may need to move a user from one group to another group and keep the same passwords for the user instead of removing the user to apply new passwords.
- User passwords are entered using plaintext without the **encrypted** parameter and are encrypted according to the authentication and privacy protocols selected.
- User passwords are viewed as encrypted passwords in running and startup configs shown from **show running-config** and **show startup-config** commands respectively. Copy and paste encrypted passwords from running-configs or startup-configs to avoid entry errors.

**Examples** To add SNMP user authuser as a member of group 'usergroup', with authentication protocol MD5, authentication password 'Authpass', privacy protocol AES and privacy password 'Privpass' use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server user authuser usergroup auth md5
Authpass priv aes Privpass
```

Validate the user is assigned to the group using the **show snmp-server user** command:

|                              |            |       |         |
|------------------------------|------------|-------|---------|
| awplus#show snmp-server user |            |       |         |
| Name                         | Group name | Auth  | Privacy |
| -----                        | -----      | ----- | -----   |
| authuser                     | usergroup  | md5   | aes     |

To enter existing SNMP user 'authuser' with existing passwords as a member of group 'newusergroup' with authentication protocol MD5 with the encrypted authentication password 0x1c74b9c22118291b0ce0cd883f8dab6b74, and privacy protocol AES with the encrypted privacy password 0x0e0133db5453ebd03822b004eeacb6608f, use the following commands:

```
awplus# configure terminal
awplus(config)# snmp-server user authuser newusergroup encrypted
auth md5 0x1c74b9c22118291b0ce0cd883f8dab6b74 priv aes
0x0e0133db5453ebd03822b004eeacb6608f
```

**NOTE:** Copy and paste the encrypted passwords from the or the displayed, using the and commands respectively, into the command line to avoid key stroke errors issuing this command.

Validate the user has been moved from the first group using the **show snmp-server user** command:

|                              |              |       |         |
|------------------------------|--------------|-------|---------|
| awplus#show snmp-server user |              |       |         |
| Name                         | Group name   | Auth  | Privacy |
| -----                        | -----        | ----- | -----   |
| authuser                     | newusergroup | md5   | aes     |

To delete SNMP user 'authuser', use the following commands:

```
awplus# configure terminal
awplus(config)# no snmp-server user authuser
```

**Related commands** [show snmp-server user](#)  
[snmp-server view](#)



## snmp-server view

**Overview** Use this command to create an SNMP view that specifies a sub-tree of the MIB. Further sub-trees can then be added by specifying a new OID to an existing view. Views can be used in SNMP communities or groups to control the remote manager's access.

**NOTE:** The object identifier must be specified in a sequence of integers separated by decimal points.

The **no** variant of this command removes the specified view on the device. The view must already exist.

**Syntax** snmp-server view <view-name> <mib-name> {included|excluded}  
no snmp-server view <view-name>

| Parameter   | Description                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------|
| <view-name> | SNMP server view name.<br><br>The view name is a string up to 20 characters long and is case sensitive. |
| <mib-name>  | Object identifier of the MIB.                                                                           |
| included    | Include this OID in the view.                                                                           |
| excluded    | Exclude this OID in the view.                                                                           |

**Mode** Global Configuration

**Examples** The following command creates a view called "loc" that includes the system location MIB sub-tree.

```
awplus(config)# snmp-server view loc 1.3.6.1.2.1.1.6.0 included
```

To remove the view "loc" use the following command

```
awplus(config)# no snmp-server view loc
```

**Related commands** [show snmp-server view](#)  
[snmp-server community](#)

# test snmp trap snmp

**Overview** Use this command to test connectivity between the AlliedWare Plus device and an SNMP manager. The command tests the connectivity by sending a one-off coldStart or warmStart trap.

It does not matter whether you send a coldStart or warmStart trap; either trap lets you test the connectivity.

**Syntax** test snmp trap snmp coldstart  
test snmp trap snmp warmstart

| Parameter | Description                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------|
| coldstart | Send a one-off coldStart trap. This trap indicates that the SNMP agent is restarting with a configuration change.    |
| warmstart | Send a one-off warmStart trap. This trap indicates that the SNMP agent is restarting without a configuration change. |

**Default** n/a

**Mode** Privileged Exec

**Example** To send a one-off coldStart trap to the SNMP manager configured on the device, use the command:

```
awplus# test snmp trap snmp coldstart
```

**Related commands** [snmp-server host](#)

**Command changes** Version 5.5.4-2.3: command added

# undebbug snmp

**Overview** This command applies the functionality of the no **debug snmp** command.

# 61

## LLDP Commands

- Contents**
- **Introduction** on page 3297
  - **clear lldp statistics** on page 3298
  - **clear lldp table** on page 3299
  - **debug lldp** on page 3300
  - **lldp faststart-count** on page 3302
  - **lldp holdtime-multiplier** on page 3303
  - **lldp management-address** on page 3304
  - **lldp med-notifications** on page 3306
  - **lldp med-tlv-select** on page 3307
  - **lldp non-strict-med-tlv-order-check** on page 3311
  - **lldp notification-interval** on page 3312
  - **lldp notifications** on page 3313
  - **lldp port-number-type** on page 3314
  - **lldp reinit** on page 3316
  - **lldp run** on page 3317
  - **lldp timer** on page 3318
  - **lldp tlv-select** on page 3319
  - **lldp transmit receive** on page 3321
  - **lldp tx-delay** on page 3323
  - **location civic-location configuration** on page 3324
  - **location civic-location identifier** on page 3329
  - **location civic-location-id** on page 3330
  - **location coord-location configuration** on page 3332
  - **location coord-location identifier** on page 3335
  - **location coord-location-id** on page 3337
  - **location elin-location** on page 3339
  - **location elin-location-id** on page 3340
  - **show debugging lldp** on page 3342
  - **show lldp** on page 3344
  - **show lldp interface** on page 3347
  - **show lldp local-info** on page 3350
  - **show lldp neighbors** on page 3356
  - **show lldp neighbors detail** on page 3358
  - **show lldp statistics** on page 3362
  - **show lldp statistics interface** on page 3365
  - **show location** on page 3368

# Introduction

**Overview** LLDP and LLDP-MED can be configured using the commands in this chapter, or by using SNMP with the LLDP-MIB and LLDP-EXT-DOT1-MIB (see the [Support for Allied Telesis Enterprise MIBs in AlliedWare Plus](#)).

The Voice VLAN feature can be configured using commands in the [VLAN Commands](#) chapter.

For more information about LLDP, see the [LLDP Feature Overview and Configuration Guide](#).

LLDP can transmit a lot of data about the network. Typically, the network information gathered using LLDP is transferred to a Network Management System by SNMP. For security reasons, we recommend using SNMPv3 for this purpose (see the [SNMP Feature Overview and Configuration Guide](#)).

LLDP operates over physical ports only. For example, it can be configured on switch ports that belong to static or dynamic channel groups, but not on the channel groups themselves.

# clear lldp statistics

**Overview** This command clears all LLDP statistics (packet and event counters) associated with specified ports. If no port list is supplied, LLDP statistics for all ports are cleared.

**Syntax** `clear lldp statistics [interface <port-list>]`

| Parameter   | Description                                           |
|-------------|-------------------------------------------------------|
| <port-list> | The ports for which the statistics are to be cleared. |

**Mode** Privileged Exec

**Examples** To clear the LLDP statistics on port1.0.1 and port1.0.4 use the command:

```
awplus# clear lldp statistics interface port1.0.1,port1.0.4
```

To clear all LLDP statistics for all ports, use the command:

```
awplus# clear lldp statistics
```

**Related commands** [show lldp statistics](#)  
[show lldp statistics interface](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# clear lldp table

**Overview** This command clears the table of LLDP information received from neighbors through specified ports. If no port list is supplied, neighbor information is cleared for all ports.

**Syntax** `clear lldp table [interface <port-list>]`

| Parameter   | Description                                                          |
|-------------|----------------------------------------------------------------------|
| <port-list> | The ports for which the neighbor information table is to be cleared. |

**Mode** Privileged Exec

**Examples** To clear the table of neighbor information received on port1.0.1 and port1.0.4, use the command:

```
awplus#clear lldp table interface port1.0.1,port1.0.4
```

To clear the entire table of neighbor information received through all ports, use the command:

```
awplus# clear lldp table
```

**Related commands** [show lldp neighbors](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## debug lldp

**Overview** This command enables specific LLDP debug for specified ports. When LLDP debugging is enabled, diagnostic messages are entered into the system log. If no port list is supplied, the specified debugging is enabled for all ports.

The **no** variant of this command disables specific LLDP debug for specified ports. If no port list is supplied, the specified debugging is disabled for all ports.

**Syntax** debug lldp {[rx][rxpkt][tx][txpkt]} [interface [<port-list>]]  
debug lldp operation  
no debug lldp {[rx][rxpkt][tx][txpkt]} [interface [<port-list>]]  
no debug lldp operation  
no debug lldp all

| Parameter   | Description                                      |
|-------------|--------------------------------------------------|
| rx          | LLDP receive debug.                              |
| rxpkt       | Raw LLDPDUs received in hex format.              |
| tx          | LLDP transmit debug.                             |
| txpkt       | Raw Tx LLDPDUs transmitted in hex format.        |
| <port-list> | The ports for which debug is to be configured.   |
| operation   | Debug for LLDP internal operation on the switch. |
| all         | Disables all LLDP debugging for all ports.       |

**Default** By default no debug is enabled for any ports.

**Mode** Privileged Exec



**Examples** To enable debugging of LLDP receive on port1.0.1 and port1.0.4, use the command:

```
awplus# debug lldp rx interface port1.0.1,port1.0.4
```

To enable debugging of LLDP transmit with packet dump on all ports, use the command:

```
awplus# debug lldp tx txpkt
```

To disable debugging of LLDP receive on port1.0.1 and port1.0.4, use the command:

```
awplus# no debug lldp rx interface port1.0.1,port1.0.4
```

To turn off all LLDP debugging on all ports, use the command:

```
awplus# no debug lldp all
```

**Related commands** [show debugging lldp](#)  
[show running-config lldp](#)  
[terminal monitor](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## lldp faststart-count

**Overview** Use this command to configure the fast start count for LLDP-MED. The fast start count determines the number of fast start advertisements a port sends when initiating LLDP-MED advertisements. This occurs, for example, when a new LLDP-MED capable device is detected.

The **no** variant of this command resets the LLDP-MED fast start count to the default (3).

**Syntax** `lldp faststart-count <1-10>`  
`no lldp faststart-count`

| Parameter                 | Description                                      |
|---------------------------|--------------------------------------------------|
| <code>&lt;1-10&gt;</code> | The number of fast start advertisements to send. |

**Default** The default fast start count is 3.

**Mode** Global Configuration

**Examples** To set the fast start count to 5, use the command:

```
awplus# configure terminal
awplus(config)# lldp faststart-count 5
```

To reset the fast start count to the default setting (3), use the command:

```
awplus# configure terminal
awplus(config)# no lldp faststart-count
```

**Related commands** [show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# lldp holdtime-multiplier

**Overview** This command sets the holdtime multiplier value. This value is multiplied by the transmit interval to determine the advertised Time To Live (TTL) value advertised to neighbors.

The **no** variant of this command sets the multiplier back to its default.

**Syntax** `lldp holdtime-multiplier <2-10>`  
`no lldp holdtime-multiplier`

| Parameter                 | Description            |
|---------------------------|------------------------|
| <code>&lt;2-10&gt;</code> | The multiplier factor. |

**Default** The default holdtime multiplier value is 4.

**Mode** Global Configuration

**Usage** The Time-To-Live (TTL) specifies how long the advertised information remains valid for neighbors. If the TTL expires before receiving an update, the neighbor removes the information from its database.

**Examples** To set the holdtime multiplier to 2, use the commands:

```
awplus# configure terminal
awplus(config)# lldp holdtime-multiplier 2
```

To set the holdtime multiplier back to its default, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp holdtime-multiplier 2
```

**Related commands** [show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# lldp management-address

**Overview** This command sets the IPv4 address to be advertised to neighbors (in the Management Address TLV) via the specified ports. This address will override the default address for these ports.

The **no** variant of this command clears the user-configured management IP address advertised to neighbors via the specified ports. The advertised address reverts to the default.

**Syntax** `lldp management-address <ipaddr>`  
`no lldp management-address`

| Parameter                   | Description                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;ipaddr&gt;</code> | The IPv4 address to be advertised to neighbors, in dotted decimal format. This must be one of the IP addresses already configured on the device. |

**Default** The local loopback interface's primary IPv4 address, if configured. Alternatively, the primary IPv4 interface address of the lowest numbered VLAN that the port belongs to, or if no VLAN IP addresses are configured, the MAC address of the device's baseboard.

**Mode** Interface Configuration

**Usage notes** To see the management address that will be advertised, use the [show lldp interface](#) command or [show lldp local-info](#) command.

**Examples** To set the management address advertised by port1.0.1 and port1.0.2 to 192.168.1.6, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp management-address 192.168.1.6
```

To clear the user-configured management address advertised by port1.0.1 and port1.0.2, and revert to using the default address, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp management-address
```

**Related commands** [show lldp interface](#)  
[show lldp local-info](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# lldp med-notifications

**Overview** Use this command to enable LLDP to send LLDP-MED Topology Change Detected SNMP notifications relating to the specified ports. The switch sends an SNMP event notification when a new LLDP-MED compliant IP Telephony device is connected to or disconnected from a port on the switch.

Use the **no** variant of this command to disable the sending of LLDP-MED Topology Change Detected notifications relating to the specified ports.

**Syntax** `lldp med-notifications`  
`no lldp med-notifications`

**Default** The sending of LLDP-MED notifications is disabled by default.

**Mode** Interface Configuration

**Examples** To enable the sending of LLDP-MED Topology Change Detected notifications relating to ports port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp med-notifications
```

To disable the sending of LLDP-MED notifications relating to port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp med-notifications
```

**Related commands** [lldp notification-interval](#)  
[lldp notifications](#)  
[snmp-server enable trap](#)  
[show lldp interface](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

## lldp med-tlv-select

**Overview** Use this command to enable LLDP-MED Organizationally Specific TLVs for transmission in LLDP advertisements via the specified ports. The LLDP-MED Capabilities TLV must be enabled before any of the other LLDP-MED Organizationally Specific TLVs are enabled.

Use the **no** variant of this command to disable the specified LLDP-MED Organizationally Specific TLVs for transmission in LLDP advertisements via these ports. In order to disable the LLDP-MED Capabilities TLV, you must also disable the rest of these TLVs. Disabling all these TLVs disables LLDP-MED advertisements.

**Syntax** `lldp med-tlv-select [capabilities] [network-policy] [location]  
[power-management-ext] [inventory-management]  
lldp med-tlv-select all  
no lldp med-tlv-select [capabilities] [network-policy]  
[location] [power-management-ext] [inventory-management]  
no lldp med-tlv-select all`

| Parameter            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| capabilities         | LLDP-MED Capabilities TLV. When this is enabled, the MAC/PHY Configuration/Status TLV from IEEE 802.3 Organizationally Specific TLVs is also automatically included in LLDP-MED advertisements, whether or not it has been explicitly enabled by the <b>lldp tlv-select</b> command.                                                                                                                                                                                         |
| network-policy       | Network Policy TLV. This TLV is transmitted if Voice VLAN parameters have been configured using the commands: <ul style="list-style-type: none"> <li>• <b>switchport voice dscp</b></li> <li>• <b>switchport voice vlan</b></li> <li>• <b>switchport voice vlan priority</b></li> </ul>                                                                                                                                                                                      |
| location             | Location Identification TLV. This TLV is transmitted if location information has been configured using the commands: <ul style="list-style-type: none"> <li>• <b>location elin-location-id</b></li> <li>• <b>location civic-location identifier</b></li> <li>• <b>location civic-location configuration</b></li> <li>• <b>location coord-location identifier</b></li> <li>• <b>location coord-location configuration</b></li> <li>• <b>location elin-location</b></li> </ul> |
| power-management-ext | Extended Power-via-MDI TLV. This TLV is transmitted if the port is PoE capable, and PoE is enabled ( <b>power-inline enable</b> ).                                                                                                                                                                                                                                                                                                                                           |
| inventory-management | Inventory Management TLV Set, including the following TLVs: <ul style="list-style-type: none"> <li>• Hardware Revision</li> <li>• Firmware Revision</li> <li>• Software Revision</li> <li>• Serial Number</li> <li>• Manufacturer Name</li> <li>• Model Name</li> <li>• Asset ID</li> </ul>                                                                                                                                                                                  |
| all                  | All LLDP-MED Organizationally Specific TLVs.                                                                                                                                                                                                                                                                                                                                                                                                                                 |



**Default** By default, LLDP-MED Capabilities, Network Policy, Location Identification, and Extended Power-via-MDI TLVs are enabled. Therefore, if LLDP is enabled using the **lldp run** command, by default LLDP-MED advertisements are transmitted on ports that detect LLDP-MED neighbors connected to them.

**Mode** Interface Configuration

**Usage notes** LLDP-MED TLVs are only sent in advertisements via a port if there is an LLDP-MED-capable device connected to it. To see whether there are LLDP-MED capable devices connected to the ports, use the **show lldp neighbors** command.

**Examples** To enable inclusion of the Inventory TLV Set in advertisements transmitted via port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp med-tlv-select inventory-management
```

To exclude the Inventory TLV Set in advertisements transmitted via port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp med-tlv-select inventory-management
```

To disable LLDP-MED advertisements transmitted via port1.0.1 and port1.0.2, disable all these TLVs using the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp med-tlv-select all
```

**Related commands**

- lldp tlv-select**
- location civic-location identifier**
- location civic-location configuration**
- location coord-location identifier**
- location coord-location configuration**
- location elin-location**
- show lldp interface**
- switchport voice dscp**
- switchport voice vlan**
- switchport voice vlan priority**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# lldp non-strict-med-tlv-order-check

**Overview** Use this command to enable non-strict order checking for LLDP-MED advertisements it receives. That is, use this command to enable LLDP to receive and store TLVs from LLDP-MED advertisements even if they do not use standard TLV order.

Use the **no** variant of this command to disable non-strict order checking for LLDP-MED advertisements, that is, to set strict TLV order checking, so that LLDP discards any LLDP-MED TLVs that occur before the LLDP-MED Capabilities TLV in an advertisement.

**Syntax** `lldp non-strict-med-tlv-order-check`  
`no lldp non-strict-med-tlv-order-check`

**Default** By default TLV non-strict order checking for LLDP-MED advertisements is disabled. That is, strict order checking is applied to LLDP-MED advertisements, according to ANSI/TIA-1057, and LLDP-MED TLVs in non-standard order are discarded.

**Mode** Global Configuration

**Usage notes** The ANSI/TIA-1057 specifies standard order for TLVs in LLDP-MED advertisements, and specifies that if LLDP receives LLDP advertisements with non-standard LLDP-MED TLV order, the TLVs in non-standard order should be discarded. This implementation of LLDP-MED follows the standard: it transmits TLVs in the standard order, and by default discards LLDP-MED TLVs that occur before the LLDP-MED Capabilities TLV in an advertisement. However, some implementations of LLDP transmit LLDP-MED advertisements with non-standard TLV order. To receive and store the data from these non-standard advertisements, enable non-strict order checking for LLDP-MED advertisements using this command.

**Examples** To enable strict TLV order checking, use the commands:

```
awplus# configure terminal
awplus(config)# lldp tlv-order-check
```

To disable strict TLV order checking, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp tlv-order-check
```

**Related commands** [show running-config lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## lldp notification-interval

**Overview** This command sets the notification interval. This is the minimum interval between LLDP SNMP notifications (traps) of each kind (LLDP Remote Tables Change Notification and LLDP-MED Topology Change Notification).  
  
The **no** variant of this command sets the notification interval back to its default.

**Syntax** `lldp notification-interval <5-3600>`  
`no lldp notification-interval`

| Parameter                   | Description              |
|-----------------------------|--------------------------|
| <code>&lt;5-3600&gt;</code> | The interval in seconds. |

**Default** The default notification interval is 5 seconds.

**Mode** Global Configuration

**Examples** To set the notification interval to 20 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# lldp notification-interval 20
```

To set the notification interval back to its default, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp notification-interval
```

**Related commands** [lldp notifications](#)  
[show lldp](#)

# lldp notifications

**Overview** This command enables the sending of LLDP SNMP notifications (traps) relating to specified ports.

The **no** variant of this command disables the sending of LLDP SNMP notifications for specified ports.

**Syntax** lldp notifications  
no lldp notifications

**Default** The sending of LLDP SNMP notifications is disabled by default.

**Mode** Interface Configuration

**Examples** To enable sending of LLDP SNMP notifications for port1.0.1 and port1.0.2, use the commands:

```
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp notifications
```

To disable sending of LLDP SNMP notifications for port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp notifications
```

**Related commands** **lldp notification-interval**  
**show lldp interface**  
**snmp-server enable trap**

## lldp port-number-type

**Overview** This command sets the type of port identifier used to enumerate, that is to count, the LLDP MIB local port entries. The LLDP MIB (IEEE Standard 802.1AB-2005, Section 12, LLDP MIB Definitions.) requires the port number value to count LLDP local port entries.

This command also enables you to optionally set an interface index to enumerate the LLDP MIB local port entries, if required by your management system.

The **no** variant of this command resets the type of port identifier back to the default setting (number).

**Syntax** `lldp port-number-type [number|ifindex]`  
`no lldp port-number-type`

| Parameter | Description                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------|
| number    | Set the type of port identifier to a port number to enumerate the LLDP MIB local port entries.      |
| ifindex   | Set the type of port identifier to an interface index to enumerate the LLDP MIB local port entries. |

**Default** The default port identifier type is number. The no variant of this command sets the port identifier type to the default.

**Mode** Global Configuration

**Examples** To set the type of port identifier used to enumerate LLDP MIB local port entries to port numbers, use the commands:

```
awplus# configure terminal
awplus(config)# lldp port-number-type number
```

To set the type of port identifier used to enumerate LLDP MIB local port entries to interface indexes, use the commands:

```
awplus# configure terminal
awplus(config)# lldp port-number-type ifindex
```

To reset the type of port identifier used to enumerate LLDP MIB local port entries the default (port numbers), use the commands:

```
awplus# configure terminal
awplus(config)# no lldp port-number-type
```

**Related commands** [show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# lldp reinit

**Overview** This command sets the value of the reinitialization delay. This is the minimum time after disabling LLDP on a port before it can reinitialize.

The **no** variant of this command sets the reinitialization delay back to its default setting.

**Syntax** `lldp reinit <1-10>`  
`no lldp reinit`

| Parameter | Description           |
|-----------|-----------------------|
| <1-10>    | The delay in seconds. |

**Default** The default reinitialization delay is 2 seconds.

**Mode** Global Configuration

**Examples** To set the reinitialization delay to 3 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# lldp reinit 3
```

To set the reinitialization delay back to its default, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp reinit
```

**Related commands** [show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V



# lldp run

**Overview** This command enables the operation of LLDP on the device.

The **no** variant of this command disables the operation of LLDP on the device. The LLDP configuration remains unchanged.

**Syntax** lldp run  
no lldp run

**Default** LLDP is disabled by default.

**Mode** Global Configuration

**Examples** To enable LLDP operation, use the commands:

```
awplus# configure terminal
awplus(config)# lldp run
```

To disable LLDP operation, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp run
```

**Related commands** [show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# lldp timer

**Overview** This command sets the value of the transmit interval. This is the interval between regular transmissions of LLDP advertisements.

The **no** variant of this command sets the transmit interval back to its default.

**Syntax** `lldp timer <5-32768>`  
`no lldp timer`

| Parameter | Description                                                                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <5-32768> | The transmit interval in seconds. The transmit interval must be at least four times the transmission delay timer ( <b>lldp tx-delay</b> command). |

**Default** The default transmit interval is 30 seconds.

**Mode** Global Configuration

**Examples** To set the transmit interval to 90 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# lldp timer 90
```

To set the transmit interval back to its default, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp timer
```

**Related commands** **lldp tx-delay**  
**show lldp**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## lldp tlv-select

**Overview** This command enables one or more optional TLVs, or all TLVs, for transmission in LLDP advertisements via the specified ports. The TLVs can be specified in any order; they are placed in LLDP frames in a fixed order (as described in IEEE 802.1AB). The mandatory TLVs (Chassis ID, Port ID, Time To Live, End of LLDPDU) are always included in LLDP advertisements.

In LLDP-MED advertisements the MAC/PHY Configuration/Status TLV will be always be included regardless of whether it is selected by this command.

The **no** variant of this command disables the specified optional TLVs, or all optional TLVs, for transmission in LLDP advertisements via the specified ports.

**Syntax** `lldp tlv-select {[<tlv>]...}`  
`lldp tlv-select all`  
`no lldp tlv-select {[<tlv>]...}`  
`no lldp tlv-select all`

| Parameter | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <tlv>     | The TLV to transmit in LLDP advertisements. One of these keywords: <ul style="list-style-type: none"><li>• port-description (specified by the <b>description (interface)</b>)</li><li>• system-name (specified by the <b>hostname</b>)</li><li>• system-description</li><li>• system-capabilities</li><li>• management-address</li><li>• port-vlan</li><li>• port-and-protocol-vlans</li><li>• vlan-names</li><li>• protocol-ids</li><li>• mac-phy-config</li><li>• power-management (Power Via MDI TLV)</li><li>• link-aggregation</li><li>• max-frame-size</li></ul> |
| all       | All TLVs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Default** By default, no optional TLVs are included in LLDP advertisements. The MAC/PHY Configuration/Status TLV (**mac-phy-config**) is included in LLDP-MED advertisements whether or not it is selected by this command.

**Mode** Interface Configuration

**Examples** To include the management-address and system-name TLVs in advertisements transmitted via port1.0.1 and port1.0.4, use the commands:

```
awplus#configure terminal
awplus(config)# interface port1.0.1,port1.0.4
awplus(config-if)# lldp tlv-select management-address system-name
```

To include all optional TLVs in advertisements transmitted via port1.0.1 and port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.4
awplus(config-if)# lldp tlv-select all
```

To exclude the management-address and system-name TLVs from advertisements transmitted via port1.0.1 and port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.4
awplus(config-if)# no lldp tlv-select management-address system-name
```

To exclude all optional TLVs from advertisements transmitted via port1.0.1 and port1.0.4, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.4
awplus(config-if)# no lldp tlv-select all
```

**Related commands**

- description (interface)**
- hostname**
- lldp med-tlv-select**
- show lldp interface**
- show lldp local-info**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# lldp transmit receive

**Overview** This command enables transmission and/or reception of LLDP advertisements to or from neighbors through the specified ports.

The **no** variant of this command disables transmission and/or reception of LLDP advertisements through specified ports.

**Syntax** `lldp {[transmit] [receive]}`  
`no lldp {[transmit] [receive]}`

| Parameter | Description                                                                   |
|-----------|-------------------------------------------------------------------------------|
| transmit  | Enable or disable transmission of LLDP advertisements via this port or ports. |
| receive   | Enable or disable reception of LLDP advertisements via this port or ports.    |

**Default** LLDP advertisement transmission and reception are enabled on all ports by default.

**Mode** Interface Configuration

**Examples** To enable transmission of LLDP advertisements on port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp transmit
```

To enable LLDP advertisement transmission and reception on port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# lldp transmit receive
```

To disable LLDP advertisement transmission and reception on port1.0.1 and port1.0.2, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.2
awplus(config-if)# no lldp transmit receive
```

**Related commands** [show lldp interface](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

## lldp tx-delay

**Overview** This command sets the value of the transmission delay timer. This is the minimum time interval between transmitting LLDP advertisements due to a change in LLDP local information.

The **no** variant of this command sets the transmission delay timer back to its default setting.

**Syntax** `lldp tx-delay <1-8192>`  
`no lldp tx-delay`

| Parameter | Description                                                                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <1-8192>  | The transmission delay in seconds. The transmission delay cannot be greater than a quarter of the transmit interval ( <b>lldp timer</b> command). |

**Default** The default transmission delay timer is 2 seconds.

**Mode** Global Configuration

**Examples** To set the transmission delay timer to 12 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# lldp tx-delay 12
```

To set the transmission delay timer back to its default, use the commands:

```
awplus# configure terminal
awplus(config)# no lldp tx-delay
```

**Related commands** [lldp timer](#)  
[show lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# location civic-location configuration

**Overview** Use these commands to configure a civic address location. The country parameter must be specified first, and at least one of the other parameters must be configured before the location can be assigned to a port.

Use the **no** variants of this command to delete civic address parameters from the location.

**Syntax**

```
country <country>
state <state>
no state
county <county>
no county
city <city>
no city
division <division>
no division
neighborhood <neighborhood>
no neighborhood
street-group <street-group>
no street-group
leading-street-direction <leading-street-direction>
no leading-street-direction
trailing-street-suffix <trailing-street-suffix>
no trailing-street-suffix
street-suffix <street-suffix>
no street-suffix
house-number <house-number>
no house-number
house-number-suffix <house-number-suffix>
no house-number-suffix
landmark <landmark>
no landmark
additional-information <additional-information>
no additional-information
```



**Syntax** name *<name>*  
**(cont.)** no name  
postalcode *<postalcode>*  
no postalcode  
building *<building>*  
no building  
unit *<unit>*  
no unit  
floor *<floor>*  
no floor  
room *<room>*  
no room  
place-type *<place-type>*  
no place-type  
postal-community-name *<postal-community-name>*  
no postal-community-name  
post-office-box *<post-office-box>*  
no post-office-box  
additional-code *<additional-code>*  
no additional-code  
seat *<seat>*  
no seat  
primary-road-name *<primary-road-name>*  
no primary-road-name  
road-section *<road-section>*  
no road-section  
branch-road-name *<branch-road-name>*  
no branch-road-name  
sub-branch-road-name *<sub-branch-road-name>*  
no sub-branch-road-name  
street-name-pre-modifier *<street-name-pre-modifier>*  
no street-name-pre-modifier  
streetname-post-modifier *<streetname-post-modifier>*  
no streetname-post-modifier

| Parameter              | Description                                                                       |
|------------------------|-----------------------------------------------------------------------------------|
| <i>&lt;country&gt;</i> | Upper-case two-letter country code, as specified in ISO 3166.                     |
| <i>&lt;state&gt;</i>   | State (Civic Address (CA) Type 1): national subdivisions (state, canton, region). |

| Parameter                                     | Description                                                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------|
| <code>&lt;county&gt;</code>                   | County (CA Type 2): County, parish, gun (JP), district (IN).                       |
| <code>&lt;city&gt;</code>                     | City (CA Type 3): city, township, shi (JP).                                        |
| <code>&lt;division&gt;</code>                 | City division (CA Type 4): City division, borough, city district, ward, chou (JP). |
| <code>&lt;neighborhood&gt;</code>             | Neighborhood (CA Type 5): neighborhood, block.                                     |
| <code>&lt;street-group&gt;</code>             | Street group (CA Type 6): group of streets below the neighborhood level.           |
| <code>&lt;leading-street-direction&gt;</code> | Leading street direction (CA Type 16).                                             |
| <code>&lt;trailing-street-suffix&gt;</code>   | Trailing street suffix (CA Type 17).                                               |
| <code>&lt;street-suffix&gt;</code>            | Street suffix (CA Type 18): street suffix or type.                                 |
| <code>&lt;house-number&gt;</code>             | House number (CA Type 19).                                                         |
| <code>&lt;house-number-suffix&gt;</code>      | House number suffix (CA Type 20).                                                  |
| <code>&lt;landmark&gt;</code>                 | Landmark or vanity address (CA Type 21).                                           |
| <code>&lt;additional-information&gt;</code>   | Additional location information (CA Type 22).                                      |
| <code>&lt;name&gt;</code>                     | Name (CA Type 23): residence and office occupant.                                  |
| <code>&lt;postal-code&gt;</code>              | Postal/zip code (CA Type 24).                                                      |
| <code>&lt;building&gt;</code>                 | Building (CA Type 25): structure.                                                  |
| <code>&lt;unit&gt;</code>                     | Unit (CA Type 26): apartment, suite.                                               |
| <code>&lt;floor&gt;</code>                    | Floor (CA Type 27).                                                                |
| <code>&lt;room&gt;</code>                     | Room (CA Type 28).                                                                 |
| <code>&lt;place-type&gt;</code>               | Type of place (CA Type 29).                                                        |
| <code>&lt;postal-community-name&gt;</code>    | Postal community name (CA Type 30).                                                |
| <code>&lt;post-office-box&gt;</code>          | Post office box (P.O. Box) (CA Type 31).                                           |
| <code>&lt;additional-code&gt;</code>          | Additional code (CA Type 32).                                                      |

| Parameter                                      | Description                                           |
|------------------------------------------------|-------------------------------------------------------|
| <code>&lt;seat&gt;</code>                      | Seat (CA Type 33): seat (desk, cubicle, workstation). |
| <code>&lt;primary-road-name&gt;</code>         | Primary road name (CA Type 34).                       |
| <code>&lt;road-section&gt;</code>              | Road section (CA Type 35).                            |
| <code>&lt;branch-road-name&gt;</code>          | Branch road name (CA Type 36).                        |
| <code>&lt;sub-branch-road-name&gt;</code>      | Sub-branch road name (CA Type 37).                    |
| <code>&lt;street-name-pre-modifier&gt;</code>  | Street name pre-modifier (CA Type 38).                |
| <code>&lt;street-name-post-modifier&gt;</code> | Street name post-modifier (CA Type 39).               |

**Default** By default no civic address location information is configured.

**Mode** Civic Address Location Configuration

**Usage notes** The **country** parameter must be configured before any other parameters can be configured; this creates the location. The country parameter cannot be deleted. One or more of the other parameters must be configured before the location can be assigned to a port. The country parameter must be entered as an upper-case two-letter country code, as specified in ISO 3166. All other parameters are entered as alpha-numeric strings. Do not configure all the civic address parameters (this would generate TLVs that are too long). Configure a subset of these parameters—enough to consistently and precisely identify the location of the device. If the location is to be used for Emergency Call Service (ECS), the particular ECS application may have guidelines for configuring the civic address location. For more information about civic address format, see the [LLDP Feature Overview and Configuration Guide](#).

To specify the civic address location, use the **location civic-location identifier** command. To delete the civic address location, use the **no** variant of the **location civic-location identifier** command.

To assign the civic address location to particular ports, so that it can be advertised in TLVs from those ports, use the command **location civic-location-id** command.

**Examples** To configure civic address location 1 with location "27 Nazareth Avenue, Christchurch, New Zealand" in civic-address format, use the commands:

```
awplus# configure terminal
awplus(config)# location civic-location identifier 1
awplus(config-civic)# country NZ
awplus(config-civic)# city Christchurch
awplus(config-civic)# primary-road-name Nazareth
awplus(config-civic)# street-suffix Avenue
awplus(config-civic)# house-number 27
```

**Related commands** **location civic-location-id**  
**location civic-location identifier**  
**show lldp local-info**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# location civic-location identifier

**Overview** Use this command to enter the Civic Address Location Configuration mode to configure the specified location.

Use the **no** variant of this command to delete a civic address location. This also removes the location from any ports it has been assigned to.

**Syntax** location civic-location identifier <civic-loc-id>  
no location civic-location identifier <civic-loc-id>

| Parameter      | Description                                                 |
|----------------|-------------------------------------------------------------|
| <civic-loc-id> | A unique civic address location ID, in the range 1 to 4095. |

**Default** By default there are no civic address locations.

**Mode** Global Configuration

**Usage notes** To configure the location information for this civic address location identifier, use the **location civic-location configuration** command.

To associate this civic location identifier with particular ports, use the **location elin-location-id** command.

Up to 400 locations can be configured on the switch for each type of location information, up to a total of 1200 locations.

**Examples** To enter Civic Address Location Configuration mode for the civic address location with ID 1, use the commands:

```
awplus# configure terminal
awplus(config)# location civic-location identifier 1
awplus(config-civic)#
```

To delete the civic address location with ID 1, use the commands:

```
awplus# configure terminal
awplus(config)# no location civic-location identifier 1
```

**Related commands** **location civic-location-id**  
**location civic-location configuration**  
**show location**  
**show running-config lldp**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## location civic-location-id

**Overview** Use this command to assign a civic address location identifier to the ports. The civic address location must already exist. This replaces any previous assignment of civic address location for the ports. Up to one location of each type can be assigned to a port.

Use the **no** variant of this command to remove a location identifier from the ports.

**Syntax** location civic-location-id <civic-loc-id>  
no location civic-location-id [<civic-loc-id>]

| Parameter      | Description                                        |
|----------------|----------------------------------------------------|
| <civic-loc-id> | Civic address location ID, in the range 1 to 4095. |

**Default** By default no civic address location is assigned to ports.

**Mode** Interface Configuration

**Usage notes** The civic address location associated with a port can be transmitted in Location Identification TLVs via the port.

Before using this command, create the location using the following commands:

- **location civic-location identifier** command
- **location civic-location configuration** command

If a civic-address location is deleted using the **no** variant of the **location civic-location identifier** command, it is automatically removed from all ports.

**Examples** To assign the civic address location 1 to port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# location civic-location-id 1
```

To remove a civic address location from port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no location civic-location-id
```

**Related commands** **lldp med-tlv-select**  
**location civic-location identifier**  
**location civic-location configuration**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# location coord-location configuration

**Overview** Use this command to configure a coordinate-based location. All parameters must be configured before assigning this location identifier to a port.

**Syntax** latitude <latitude>  
lat-resolution <lat-resolution>  
longitude <longitude>  
long-resolution <long-resolution>  
altitude <altitude> {meters|floor}  
alt-resolution <alt-resolution>  
datum {wgs84|nad83-navd|nad83-mlw}

| Parameter         | Description                                                                                                                       |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <lat-resolution>  | Latitude resolution, as a number of valid bits, in the range 0 to 34.                                                             |
| <latitude>        | Latitude value in degrees in the range -90.0 to 90.0                                                                              |
| <long-resolution> | Longitude resolution, as a number of valid bits, in the range 0 to 34.                                                            |
| <longitude>       | Longitude value in degrees, in the range -180.0 to 180.0.                                                                         |
| <alt-resolution>  | Altitude resolution, as a number of valid bits, in the range 0 to 30. A resolution of 0 can be used to indicate an unknown value. |
| <altitude>        | Altitude value, in meters or floors.                                                                                              |
| meters            | The altitude value is in meters.                                                                                                  |
| floors            | The altitude value is in floors.                                                                                                  |
| datum             | The geodetic system (or datum) that the specified coordinate values are based on.                                                 |
| wgs84             | World Geodetic System 1984.                                                                                                       |
| nad83-navd        | North American Datum 1983 - North American Vertical Datum.                                                                        |
| nad83-mlw         | North American Datum 1983 - Mean Lower Low Water vertical datum.                                                                  |



**Default** By default no coordinate location information is configured.

**Mode** Coordinate Configuration

**Usage** Latitude and longitude values are always stored internally, and advertised in the Location Identification TLV, as 34-bit fixed-point binary numbers, with a 25-bit fractional part, irrespective of the number of digits entered by the user. Likewise altitude is stored as a 30-bit fixed point binary number, with an 8-bit fractional part. Because the user-entered decimal values are stored as fixed point binary numbers, they cannot always be represented exactly—the stored binary number is converted to a decimal number for display in the output of the **show location** command. For example, a user-entered latitude value of “2.77” degrees is displayed as “2.7699999809265136718750000”.

The **lat-resolution**, **long-resolution**, and **alt-resolution** parameters allow the user to specify the resolution of each coordinate element as the number of valid bits in the internally-stored binary representation of the value. These resolution values can be used by emergency services to define a search area.

To specify the coordinate identifier, use the **location coord-location identifier** command. To remove coordinate information, delete the coordinate location by using the **no** variant of that command.

To associate the coordinate location with particular ports, so that it can be advertised in TLVs from those ports, use the **location coord-location-id** command.

**Example** To configure the location for the White House in Washington DC, which has the coordinates based on the WGS84 datum of 38.89868 degrees North (with 22 bit resolution), 77.03723 degrees West (with 22 bit resolution), and 15 meters height (with 9 bit resolution), use the commands:

```
awplus# configure terminal
awplus(config)# location coord-location identifier 1
awplus(config-coord)# lat-resolution 22
awplus(config-coord)# latitude 38.89868
awplus(config-coord)# long-resolution 22
awplus(config-coord)# longitude -77.03723
awplus(config-coord)# alt-resolution 9
awplus(config-coord)# altitude 15 meters
awplus(config-coord)# datum wgs84
```

**Related commands** **location coord-location-id**  
**location coord-location identifier**  
**show lldp local-info**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# location coord-location identifier

**Overview** Use this command to enter Coordinate Location Configuration mode for this coordinate location.

Use the **no** variant of this command to delete a coordinate location. This also removes the location from any ports it has been assigned to.

**Syntax** location coord-location identifier *<coord-loc-id>*  
no location coord-location identifier *<coord-loc-id>*

| Parameter                   | Description                                                      |
|-----------------------------|------------------------------------------------------------------|
| <i>&lt;coord-loc-id&gt;</i> | A unique coordinate location identifier, in the range 1 to 4095. |

**Default** By default there are no coordinate locations.

**Mode** Global Configuration

**Usage** Up to 400 locations can be configured on the switch for each type of location information, up to a total of 1200 locations.

To configure this coordinate location, use the **location coord-location configuration** command.

To associate this coordinate location with particular ports, so that it can be advertised in TLVs from those ports, use the **location coord-location-id** command.

**Examples** To enter Coordinate Location Configuration mode to configure the coordinate location with ID 1, use the commands:

```
awplus# configure terminal
awplus(config)# location coord-location identifier 1
awplus(config-coord)#
```

To delete coordinate location 1, use the commands:

```
awplus# configure terminal
awplus(config)# no location coord-location identifier 1
```

**Related commands** **location coord-location-id**  
**location coord-location configuration**  
**show lldp local-info**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# location coord-location-id

**Overview** Use this command to assign a coordinate location to the ports. The coordinate location must already exist. This replaces any previous assignment of coordinate location for the ports. Up to one location of each type can be assigned to a port.

Use the **no** variant of this command to remove a location from the ports.

**Syntax** location coord-location-id <coord-loc-id>  
no location coord-location-id [<coord-loc-id>]

| Parameter      | Description                                     |
|----------------|-------------------------------------------------|
| <coord-loc-id> | Coordinate location ID, in the range 1 to 4095. |

**Default** By default no coordinate location is assigned to ports.

**Mode** Interface Configuration

**Usage notes** The coordinate location associated with a port can be transmitted in Location Identification TLVs via the port.

Before using this command, configure the location using the following commands:

- **location coord-location identifier** command
- **location coord-location configuration** command

If a coordinate location is deleted using the **no** variant of the **location coord-location identifier** command, it is automatically removed from all ports.

**Examples** To assign coordinate location 1 to port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# location coord-location-id 1
```

To remove a coordinate location from port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no location coord-location-id 1
```

**Related commands** **lldp med-tlv-select**  
**location coord-location identifier**  
**location coord-location configuration**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# location elin-location

**Overview** Use this command to create or modify an ELIN location.

Use the **no** variant of this command to delete an ELIN location, and remove it from any ports it has been assigned to.

**Syntax** `location elin-location <elin> identifier <elin-loc-id>`  
`no location elin-location identifier <elin-loc-id>`

| Parameter     | Description                                                                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <elin>        | Emergency Location Identification Number (ELIN) for Emergency Call Service (ECS), in the range 10 to 25 digits long. In North America, ELINs are typically 10 digits long. |
| <elin-loc-id> | A unique ELIN location identifier, in the range 1 to 4095.                                                                                                                 |

**Default** By default there are no ELIN location identifiers.

**Mode** Global Configuration

**Usage** Up to 400 locations can be configured on the switch for each type of location information, up to a total of 1200 locations.

To assign this ELIN location to particular ports, so that it can be advertised in TLVs from those ports, use the **location elin-location-id** command.

**Examples** To create a new ELIN location with ID 1, and configure it with ELIN "1234567890", use the commands:

```
awplus# configure terminal
awplus(config)# location elin-location 1234567890 identifier 1
```

To delete existing ELIN location with ID 1, use the commands:

```
awplus# configure terminal
awplus(config)# no location elin-location identifier 1
```

**Related commands** **location elin-location-id**  
**show lldp local-info**  
**show location**

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## location elin-location-id

**Overview** Use this command to assign an ELIN location to the ports. The ELIN location must already exist. This replaces any previous assignment of ELIN location for the ports. Up to one location of each type can be assigned to a port.

Use the **no** variant of this command to remove a location identifier from the ports.

**Syntax** `location elin-location-id <elin-loc-id>`  
`no location elin-location-id [<elin-loc-id>]`

| Parameter                        | Description                                       |
|----------------------------------|---------------------------------------------------|
| <code>&lt;elin-loc-id&gt;</code> | ELIN location identifier, in the range 1 to 4095. |

**Default** By default no ELIN location is assigned to ports.

**Mode** Interface Configuration

**Usage notes** An ELIN location associated with a port can be transmitted in Location Identification TLVs via the port.

Before using this command, configure the location using the **location elin-location** command.

If an ELIN location is deleted using the **no** variant of one of the **location elin-location** command, it is automatically removed from all ports.

**Examples** To assign ELIN location 1 to port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# location elin-location-id 1
```

To remove ELIN location 1 from port1.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1
awplus(config-if)# no location elin-location-id 1
```

**Related commands** **lldp med-tlv-select**  
**location elin-location**  
**show location**



**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

## show debugging lldp

**Overview** This command displays LLDP debug settings for specified ports. If no port list is supplied, LLDP debug settings for all ports are displayed.

**Syntax** show debugging lldp [interface <port-list>]

| Parameter   | Description                                            |
|-------------|--------------------------------------------------------|
| <port-list> | The ports for which the LLDP debug settings are shown. |

**Mode** User Exec and Privileged Exec

**Examples** To display LLDP debug settings for all ports, use the command:  
awplus# show debugging lldp  
To display LLDP debug settings for port1.0.1 to port1.0.4, use the command:  
awplus# show debugging lldp interface port1.0.1-port1.0.4

**Output** The following shows typical output.

### Example output from the show debugging lldp command

|                                                                     |     |       |     |       |
|---------------------------------------------------------------------|-----|-------|-----|-------|
| LLDP Debug settings:<br>Debugging for LLDP internal operation is on |     |       |     |       |
| Port                                                                | Rx  | RxPkt | Tx  | TxPkt |
| -----                                                               |     |       |     |       |
| 1.0.1                                                               | Yes | Yes   | No  | No    |
| 1.0.2                                                               | Yes | No    | No  | No    |
| 1.0.3                                                               | No  | No    | No  | No    |
| 1.0.4                                                               | Yes | Yes   | Yes | No    |

### Parameters in the output of the show debugging lldp command

| Parameter | Description                                                            |
|-----------|------------------------------------------------------------------------|
| Port      | Port name.                                                             |
| Rx        | Whether debugging of LLDP receive is enabled on the port.              |
| RxPkt     | Whether debugging of LLDP receive packet dump is enabled on the port.  |
| Rx        | Whether debugging of LLDP transmit is enabled on the port.             |
| RxPkt     | Whether debugging of LLDP transmit packet dump is enabled on the port. |

**Related commands** debug lldp

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## show lldp

**Overview** This command displays LLDP status and global configuration settings.

**Syntax** show lldp

**Mode** User Exec and Privileged Exec

**Example** To display LLDP status and global configuration settings, use the command:

```
awplus# show lldp
```

**Output** The following shows typical output.

**Example output from the show lldp command**

```
awplus# show lldp

LLDP Global Configuration: [Default Values]
LLDP Status Enabled [Disabled]
Notification Interval 5 secs [5]
Tx Timer Interval 30 secs [30]
Hold-time Multiplier 4 [4]
(Computed TTL value 120 secs)
Reinitialization Delay 2 secs [2]
Tx Delay 2 secs [2]

Port Number Type..... Ifindex [Port-Number]
Fast Start Count 5 [3]

LLDP Global Status:
Total Neighbor Count 47
Neighbors table last updated 0 hrs 0 mins 43 secs ago
```

**Parameters in the output of the show lldp command**

| Parameter                    | Description                                                                                                                                                   |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LLDP Status                  | Whether LLDP is enabled. Default is disabled.                                                                                                                 |
| Notification Interval        | Minimum interval between LLDP notifications.                                                                                                                  |
| Tx Timer Interval            | Transmit interval between regular transmissions of LLDP advertisements.                                                                                       |
| Hold-time Multiplier         | The holdtime multiplier. The transmit interval is multiplied by the holdtime multiplier to give the Time To Live (TTL) value that is advertised to neighbors. |
| Reinitialization Delay       | The reinitialization delay. This is the minimum time after disabling LLDP transmit on a port before it can reinitialize again.                                |
| Tx Delay                     | The transmission delay. This is the minimum time interval between transmitting advertisements due to a change in LLDP local information.                      |
| Port Number Type             | The type of port identifier used to enumerate LLDP MIB local port entries, as set by the lldp port-number-type command.                                       |
| Fast Start Count             | The number of times fast start advertisements are sent for LLDP-MED.                                                                                          |
| Total Neighbor Count         | Number of LLDP neighbors discovered on all ports.                                                                                                             |
| Neighbors table last updated | The time since the LLDP neighbor table was last updated.                                                                                                      |

**Related commands** [show lldp interface](#)  
[show running-config lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# show lldp interface

**Overview** This command displays LLDP configuration settings for specified ports. If no port list is specified, LLDP configuration for all ports is displayed.

**Syntax** show lldp interface [*<port-list>*]

| Parameter                | Description                                                          |
|--------------------------|----------------------------------------------------------------------|
| <i>&lt;port-list&gt;</i> | The ports for which the LLDP configuration settings are to be shown. |

**Mode** User Exec and Privileged Exec

**Examples** To display LLDP configuration settings for port1.0.1 to port1.0.4, use the command:

```
awplus# show lldp interface port1.0.1-port1.0.4
```

To display LLDP configuration settings for all ports, use the command:

```
awplus# show lldp interface
```

**Output** The following shows typical output.

### Example output from the show lldp interface command

```
awplus# show lldp interface port1.0.1-1.0.4
LLDP Port Status and Configuration:

* = LLDP is inactive on this port because it is a mirror analyser port
Notification Abbreviations:
 RC = LLDP Remote Tables Change TC = LLDP-MED Topology Change
TLV Abbreviations:
 Base: Pd = Port Description Sn = System Name
 Sd = System Description Sc = System Capabilities
 Ma = Management Address
 802.1: Pv = Port VLAN ID Pp = Port And Protocol VLAN ID
 Vn = VLAN Name Pi = Protocol Identity
 802.3: Mp = MAC/PHY Config/Status Po = Power Via MDI (PoE)
 La = Link Aggregation Mf = Maximum Frame Size
 MED: Mc = LLDP-MED Capabilities Np = Network Policy
 Lo = Location Identification Pe = Extended PoE In = Inventory
```

| Port   | Rx/Tx | Notif | Management Addr | Optional TLVs Enabled for Tx |          |       |            |
|--------|-------|-------|-----------------|------------------------------|----------|-------|------------|
|        |       |       |                 | Base                         | 802.1    | 802.3 | MED        |
| 1.0.1  | Rx Tx | RC -- | 192.168.100.123 | PdSnSdScMa                   | -----    | ----- | McNpLoPe-- |
| *1.0.2 | -- Tx | RC -- | 192.168.100.123 | PdSnSdScMa                   | -----    | ----- | McNpLoPe-- |
| 1.0.3  | Rx Tx | RC -- | 192.168.100.123 | Pd--SdScMa                   | PvPpVnPi | ----- | McNpLoPe-- |
| 1.0.4  | -- -- | RC -- | 192.168.100.123 | PdSnSd--Ma                   | -----    | ----- | McNpLoPe-- |

### Parameters in the output of the show lldp interface command

| Parameter                 | Description                                                                                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Port                      | Port name.                                                                                                                                                                                                                                               |
| Rx                        | Whether reception of LLDP advertisements is enabled on the port.                                                                                                                                                                                         |
| Tx                        | Whether transmission of LLDP advertisements is enabled on the port.                                                                                                                                                                                      |
| Notif                     | Whether sending SNMP notification for LLDP is enabled on the port: <ul style="list-style-type: none"> <li>RM = Remote Tables Change Notification</li> <li>TP = LLDP-MED Topology Change Notification</li> </ul>                                          |
| Management Addr           | Management address advertised to neighbors.                                                                                                                                                                                                              |
| Base TLVs Enabled for Tx  | List of optional Base TLVs enabled for transmission: <ul style="list-style-type: none"> <li>Pd = Port Description</li> <li>Sn =System Name</li> <li>Sd = System Description</li> <li>Sc =System Capabilities</li> <li>Ma = Management Address</li> </ul> |
| 802.1 TLVs Enabled for Tx | List of optional 802.1 TLVs enabled for transmission: <ul style="list-style-type: none"> <li>Pv = Port VLAN ID</li> <li>Pp = Port And Protocol VLAN ID</li> </ul>                                                                                        |



| Parameter                 | Description                                                                                                                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | <ul style="list-style-type: none"><li>• Vn = VLAN Name</li><li>• Pi =Protocol Identity</li></ul>                                                                                                                                                                        |
| 802.3 TLVs Enabled for Tx | List of optional 802.3 TLVs enabled for transmission: <ul style="list-style-type: none"><li>• Mp = MAC/PHY Configuration/Status</li><li>• Po = Power Via MDI (PoE)</li><li>• La = Link Aggregation</li><li>• Mf = Maximum Frame Size</li></ul>                          |
| MED TLVs Enabled for Tx   | List of optional LLDP-MED TLVs enabled for transmission: <ul style="list-style-type: none"><li>• Mc = LLDP-MED Capabilities</li><li>• Np = Network Policy</li><li>• Lo = Location Information,</li><li>• Pe = Extended Power-Via-MDI</li><li>• In = Inventory</li></ul> |

**Related commands** [show lldp](#)  
[show running-config lldp](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## show lldp local-info

**Overview** This command displays local LLDP information that can be transmitted through specified ports. If no port list is entered, local LLDP information for all ports is displayed.

**Syntax** `show lldp local-info [base] [dot1] [dot3] [med] [interface <port-list>]`

| Parameter   | Description                                               |
|-------------|-----------------------------------------------------------|
| base        | Information for base TLVs.                                |
| dot1        | Information for 802.1 TLVs.                               |
| dot3        | Information for 802.3 TLVs.                               |
| med         | Information for LLDP-MED TLVs.                            |
| <port-list> | The ports for which the local information is to be shown. |

**Mode** User Exec and Privileged Exec

**Usage notes** Whether and which local information is transmitted in advertisements via a port depends on:

- whether the port is set to transmit LLDP advertisements (**lldp transmit receive** command)
- which TLVs it is configured to send (**lldp tlv-select** command, **lldp med-tlv-select** command)

**Examples** To display local information transmitted via port1.0.1, use the command:

```
awplus# show lldp local-info interface port1.0.1
```

To display local information transmitted via all ports, use the command:

```
awplus# show lldp local-info
```

**Output** The following shows typical output.

**Example output from show lldp local-info**

```
LLDP Local Information:

Local port1.0.1:
Chassis ID Type MAC address
Chassis ID 0015.77c9.7453
Port ID Type Interface alias
Port ID port1.0.1
TTL 120
Port Description [not configured]

System Name awplus
System Description Allied Telesis router/switch, AW+
 v5.5.2
System Capabilities - Supported .. Bridge, Router
 - Enabled Bridge, Router
Management Address 192.168.1.6
Port VLAN ID (PVID) 1
Port & Protocol VLAN - Supported . Yes
 - Enabled ... No
 - VIDs 0
VLAN Names default

Protocol IDs 9000, 0026424203000000, 888e01, aaaa03,
 88090101, 00540000e302, 0800, 0806, 86dd
MAC/PHY Auto-negotiation Supported, Enabled
 Advertised Capability 1000BaseTFD, 100BaseTXFD, 100BaseTX,
 10BaseTFD, 10BaseT
 Operational MAU Type 1000BaseTFD (30)
Power Via MDI (PoE) Supported, Enabled
 Port Class PSE
 Pair Control Ability Disabled
 Power Class Unknown

Link Aggregation Supported, Disabled
Maximum Frame Size 1522
LLDP-MED Device Type Network Connectivity
LLDP-MED Capabilities LLDP-MED Capabilities, Network Policy,
 Location Identification,
 Extended Power - PSE, Inventory
Network Policy [not configured]
Location Identification Civic Address
 Country Code NZ

 City Christchurch
 Street Suffix Avenue
 House Number 27
 Primary Road Name Nazareth
Location Identification ELIN
 ELIN 123456789012
LLDP-MED Device Type Network Connectivity
LLDP-MED Capabilities LLDP-MED Capabilities, Network Policy,
 Location Identification,
 Extended Power - PSE, Inventory

Extended Power Via MDI (PoE) PSE
 Power Source Primary Power
 Power Priority Low
 Power Value 4.4 Watts
Inventory Management:
 Hardware Revision A-0
 Firmware Revision 1.1.0
 Software Revision v5.5.2
 Serial Number G1Q78900B
 Manufacturer Name Allied Telesis Inc.
 Model Name AT-x930-52GPX
```

|                              |
|------------------------------|
| Asset ID ..... [zero length] |
|------------------------------|

### Parameters in the output of show lldp local-info

| Parameter                        | Description                                                                                                        |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Chassis ID Type                  | Type of the Chassis ID.                                                                                            |
| Chassis ID                       | Chassis ID that uniquely identifies the local device.                                                              |
| Port ID Type                     | Type of the Port ID.                                                                                               |
| Port ID                          | Port ID of the local port through which advertisements are sent.                                                   |
| TTL                              | Number of seconds that the information advertised by the local port remains valid.                                 |
| Port Description                 | Port description of the local port, as specified by the <b>description (interface)</b> .                           |
| System Name                      | System name, as specified by the <b>hostname</b> .                                                                 |
| System Description               | System description.                                                                                                |
| System Capabilities (Supported)  | Capabilities that the local port supports.                                                                         |
| System Capabilities (Enabled)    | Enabled capabilities on the local port.                                                                            |
| Management Addresses             | Management address associated with the local port. To change this, use the <b>lldp management-address</b> command. |
| Port VLAN ID (PVID)              | VLAN identifier associated with untagged or priority tagged frames received via the local port.                    |
| Port & Protocol VLAN (Supported) | Whether Port & Protocol VLANs (PPV) is supported on the local port.                                                |
| Port & Protocol VLAN (Enabled)   | Whether the port is in one or more Port & Protocol VLANs.                                                          |
| Port & Protocol VLAN (VIDs)      | List of identifiers for Port & Protocol VLANs that the port is in.                                                 |
| VLAN Names                       | List of VLAN names for VLANs that the local port is assigned to.                                                   |
| Protocol IDs                     | List of protocols that are accessible through the local port.                                                      |
| MAC/PHY Auto-negotiation         | Auto-negotiation support and current status of the 802.3 LAN on the local port.                                    |

| Parameter                    | Description                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Power Via MDI (PoE)          | PoE-capability and current status on the local port.                                                            |
| Port Class                   | Whether the device is a PSE (Power Sourcing Entity) or a PD (Powered Device).                                   |
| Pair Control Ability         | Whether power pair selection can be controlled.                                                                 |
| Power Pairs                  | Which power pairs are selected for power ("Signal Pairs" or "Spare Pairs") if pair selection can be controlled. |
| Power Class                  | The power class of the PD device on the port (class 0, 1, 2, 3 or 4).                                           |
| Link Aggregation             | Whether the link is capable of being aggregated and it is currently in an aggregation.                          |
| Aggregated Port-ID           | Aggregated port identifier.                                                                                     |
| Maximum Frame Size           | The maximum frame size capability of the implemented MAC and PHY.                                               |
| LLDP-MED Device Type         | LLDP-MED device type.                                                                                           |
| LLDP-MED Capabilities        | Capabilities LLDP-MED capabilities supported on the local port.                                                 |
| Network Policy               | List of network policies configured on the local port.                                                          |
| VLAN ID                      | VLAN identifier for the port for the specified application type.                                                |
| Tagged Flag                  | Whether the VLAN ID is to be used as tagged or untagged.                                                        |
| Layer-2 Priority:            | Layer 2 User Priority (in the range 0 to 7).                                                                    |
| DSCP Value                   | Diffserv codepoint (in the range 0 to 63).                                                                      |
| Location Identification      | Location configured on the local port.                                                                          |
| Extended Power Via MDI (PoE) | PoE-capability and current status of the PoE parameters for Extended Power-Via-MDI TLV on the local port.       |
| Power Source                 | The power source the switch currently uses; either primary power or backup power.                               |

| Parameter            | Description                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Priority       | The power priority configured on the port; either critical, high or low.                                                                                 |
| Power Value          | The total power the switch can source over a maximum length cable to a PD device on the port. The value shows the power value in Watts from the PD side. |
| Inventory Management | Inventory information for the device.                                                                                                                    |

**Related commands** [description \(interface\)](#)  
[hostname](#)  
[lldp transmit receive](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## show lldp neighbors

**Overview** This command displays a summary of information received from neighbors via specified ports. If no port list is supplied, neighbor information for all ports is displayed.

**Syntax** `show lldp neighbors [interface <port-list>]`

| Parameter   | Description                                                  |
|-------------|--------------------------------------------------------------|
| <port-list> | The ports for which the neighbor information is to be shown. |

**Mode** User Exec and Privileged Exec

**Examples** To display neighbor information received via all ports, use the command:

```
awplus# show lldp neighbors
```

To display neighbor information received via port1.0.1 and port1.0.4 with LLDP-MED configuration, use the command:

```
awplus# show lldp neighbors interface port1.0.1,port1.0.4
```



**Output** The following shows typical output.

**Example output from the show lldp neighbors command**

| LLDP Neighbor Information:                                                         |                     |                  |                         |             |            |
|------------------------------------------------------------------------------------|---------------------|------------------|-------------------------|-------------|------------|
| Total number of neighbors on these ports .... 4                                    |                     |                  |                         |             |            |
| System Capability Codes:                                                           |                     |                  |                         |             |            |
| O = Other    P = Repeater    B = Bridge                      W = WLAN Access Point |                     |                  |                         |             |            |
| R = Router   T = Telephone   C = DOCSIS Cable Device       S = Station Only        |                     |                  |                         |             |            |
| LLDP-MED Device Type and Power Source Codes:                                       |                     |                  |                         |             |            |
| 1 = Class I    3 = Class III    PSE = PoE    Both = PoE&Local    Prim = Primary    |                     |                  |                         |             |            |
| 2 = Class II   N = Network Con.   Locl = Local   Unkn = Unknown   Back = Backup    |                     |                  |                         |             |            |
| Local Port                                                                         | Neighbor Chassis ID | Neighbor Port ID | Neighbor Sys Name       | System Cap. | MED Ty Pwr |
| 1.0.1                                                                              | 002d.3044.7ba6      | port1.0.2        | awplus                  | OPBWRCS     |            |
| 1.0.1                                                                              | 0011.3109.e5c6      | port1.0.3        | AT-9924 switch/route... | --B-R--     |            |
| 1.0.4                                                                              | 0000.10cf.8590      | port3            | AR-442S                 | --B-R--     |            |
| 1.0.4                                                                              | 00ee.4352.df51      | 192.168.1.2      | Jim's desk phone        | --B--T--    | 3 PSE      |

**Parameters in the output of the show lldp neighbors command**

| Parameter           | Description                                                      |
|---------------------|------------------------------------------------------------------|
| Local Port          | Local port on which the neighbor information was received.       |
| Neighbor Chassis ID | Chassis ID that uniquely identifies the neighbor.                |
| Neighbor Port Name  | Port ID of the neighbor.                                         |
| Neighbor Sys Name   | System name of the LLDP neighbor.                                |
| Neighbor Capability | Capabilities that are supported and enabled on the neighbor.     |
| System Capability   | System Capabilities of the LLDP neighbor.                        |
| MED Device Type     | LLDP-MED Device class (Class I, II, III or Network Connectivity) |
| MED Power Source    | LLDP-MED Power Source                                            |

**Related commands** [show lldp neighbors detail](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## show lldp neighbors detail

**Overview** This command displays in detail the information received from neighbors via specified ports. If no port list is supplied, detailed neighbor information for all ports is displayed.

**Syntax** `show lldp neighbors detail [base] [dot1] [dot3] [med] [interface <port-list>]`

| Parameter   | Description                                                  |
|-------------|--------------------------------------------------------------|
| base        | Information for base TLVs.                                   |
| dot1        | Information for 802.1 TLVs.                                  |
| dot3        | Information for 803.1 TLVs.                                  |
| med         | Information for LLDP-MED TLVs.                               |
| <port-list> | The ports for which the neighbor information is to be shown. |

**Mode** User Exec and Privileged Exec

**Examples** To display detailed neighbor information received via all ports, use the command:

```
awplus# show lldp neighbors detail
```

To display detailed neighbor information received via port1.0.1, use the command:

```
awplus# show lldp neighbors detail interface port1.0.1
```

**Output** The following shows typical output.

**Example output from the show lldp neighbors detail command**

```
awplus#show lldp neighbors detail interface port1.0.1
LLDP Detailed Neighbor Information:

Local port1.0.1:
 Neighbors table last updated 0 hrs 0 mins 40 secs ago
 Chassis ID Type MAC address
 Chassis ID 0004.cd28.8754
 Port ID Type Interface alias
 Port ID port1.0.6
 TTL 120 (secs)
 Port Description [zero length]
 System Name awplus
 System Description Allied Telesis router/switch, AW+ v5.4.6
 System Capabilities - Supported .. Bridge, Router
 - Enabled Bridge, Router
 Management Addresses 0004.cd28.8754
 Port VLAN ID (PVID) 1
 Port & Protocol VLAN - Supported . Yes
 - Enabled ... Yes
 - VIDs 5
 VLAN Names default, vlan5
 Protocol IDs 9000, 0026424203000000, 888e01, 8100,
 88090101, 00540000e302, 0800, 0806, 86dd
 MAC/PHY Auto-negotiation Supported, Enabled
 Advertised Capability 1000BaseTFD, 100BaseTXFD, 100BaseTX,
 10BaseTFD, 10BaseT
 Operational MAU Type 1000BaseTFD (30)
 Power Via MDI (PoE) [not advertised]
 Link Aggregation Supported, Disabled
 Maximum Frame Size 1522 (Octets)
 LLDP-MED Device Type Network Connectivity
 LLDP-MED Capabilities LLDP-MED Capabilities, Network Policy,
 Location Identification,
 Extended Power - PSE, Inventory
 Network Policy [not advertised]
 Location Identification [not advertised]
 Extended Power Via MDI (PoE) PD
 Power Source PSE
 Power Priority High
 Power Value 4.4 Watts
 Inventory Management:
 Hardware Revision X1-0
 Firmware Revision 1.1.0
 Software Revision v5.4.6
 Serial Number M1NB73008
 Manufacturer Name Allied Telesis Inc.
 Model Name x230-28GP
 Asset ID [zero length]
```

**Parameters in the output of the show lldp neighbors detail command**

| Parameter       | Description                                       |
|-----------------|---------------------------------------------------|
| Chassis ID Type | Type of the Chassis ID.                           |
| Chassis ID      | Chassis ID that uniquely identifies the neighbor. |
| Port ID Type    | Type of the Port ID.                              |

| Parameter                        | Description                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------|
| Port ID                          | Port ID of the neighbor.                                                                  |
| TTL                              | Number of seconds that the information advertised by the neighbor remains valid.          |
| Port Description                 | Port description of the neighbor's port.                                                  |
| System Name                      | Neighbor's system name.                                                                   |
| System Description               | Neighbor's system description.                                                            |
| System Capabilities (Supported)  | Capabilities that the neighbor supports.                                                  |
| System Capabilities (Enabled)    | Capabilities that are enabled on the neighbor.                                            |
| Management Addresses             | List of neighbor's management addresses.                                                  |
| Port VLAN ID (PVID)              | VLAN identifier associated with untagged or priority tagged frames for the neighbor port. |
| Port & Protocol VLAN (Supported) | Whether Port & Protocol VLAN is supported on the LLDP neighbor.                           |
| Port & Protocol VLAN (Enabled)   | Whether Port & Protocol VLAN is enabled on the LLDP neighbor.                             |
| Port & Protocol VLAN (VIDs)      | List of Port & Protocol VLAN identifiers.                                                 |
| VLAN Names                       | List of names of VLANs that the neighbor's port belongs to.                               |
| Protocol IDs                     | List of protocols that are accessible through the neighbor's port.                        |
| MAC/PHY Auto-negotiation         | Auto-negotiation configuration and status                                                 |
| Power Via MDI (PoE)              | PoE configuration and status of 802.3 Power- Via-MDI TLV                                  |
| Link Aggregation                 | Link aggregation information                                                              |
| Maximum Frame Size               | The maximum frame size capability                                                         |
| LLDP-MED Device Type             | LLDP-MED Device type                                                                      |
| LLDP-MED Capabilities            | LLDP-MED capabilities supported                                                           |

| Parameter                    | Description                       |
|------------------------------|-----------------------------------|
| Network Policy               | List of network policies          |
| Location Identification      | Location information              |
| Extended Power Via MDI (PoE) | PoE-capability and current status |
| Inventory Management         | Inventory information             |

**Related commands** [show lldp neighbors](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

# show lldp statistics

**Overview** This command displays the global LLDP statistics (packet and event counters).

**Syntax** show lldp statistics

**Mode** User Exec and Privileged Exec

**Example** To display global LLDP statistics information, use the command:  
awplus# show lldp statistics

**Output** The following shows typical output.

**Example output from the show lldp statistics command**

```
awplus# show lldp statistics
Global LLDP Packet and Event counters:
 Frames: Out 345
 In 423
 In Errored 0
 In Dropped 0
 TLVs: Unrecognized 0
 Discarded 0
 Neighbors: New Entries 20
 Deleted Entries 20
 Dropped Entries 0
 Entry Age-outs 20
```

**Parameters in the output of the show lldp statistics command**

| Parameter                        | Description                                                                                                                                        |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Frames Out                       | Number of LLDPDU frames transmitted.                                                                                                               |
| Frames In                        | Number of LLDPDU frames received.                                                                                                                  |
| Frames In Errored                | Number of invalid LLDPDU frames received.                                                                                                          |
| Frames In Dropped                | Number of LLDPDU frames received and discarded for any reason.                                                                                     |
| TLVs Unrecognized                | Number of LLDP TLVs received that are not recognized but the TLV type is in the range of reserved TLV types.                                       |
| TLVs Discarded                   | Number of LLDP TLVs discarded for any reason.                                                                                                      |
| Neighbors New Entries            | Number of times the information advertised by neighbors has been inserted into the neighbor table.                                                 |
| Neighbors Deleted Entries        | Number of times the information advertised by neighbors has been removed from the neighbor table.                                                  |
| Neighbors Dropped Entries        | Number of times the information advertised by neighbors could not be entered into the neighbor table because of insufficient resources.            |
| Neighbors Entry Age-outs Entries | Number of times the information advertised by neighbors has been removed from the neighbor table because the information TTL interval has expired. |

**Related commands** [clear lldp statistics](#)  
[show lldp statistics interface](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V



## show lldp statistics interface

**Overview** This command displays the LLDP statistics (packet and event counters) for specified ports. If no port list is supplied, LLDP statistics for all ports are displayed.

**Syntax** show lldp statistics interface [*<port-list>*]

| Parameter                | Description                                         |
|--------------------------|-----------------------------------------------------|
| <i>&lt;port-list&gt;</i> | The ports for which the statistics are to be shown. |

**Mode** User Exec and Privileged Exec

**Examples** To display LLDP statistics information for all ports, use the command:

```
awplus# show lldp statistics interface
```

To display LLDP statistics information for port1.0.1 and port1.0.4, use the command:

```
awplus# show lldp statistics interface port1.0.1,port1.0.4
```

## Output Example output from the show lldp statistics interface command

```
awplus# show lldp statistics interface eth1,eth2

LLDP Packet and Event Counters:

eth1
 Frames: Out 27
 In 22
 In Errored 0
 In Dropped 0
 TLVs: Unrecognized 0
 Discarded 0
 Neighbors: New Entries 3
 Deleted Entries 0
 Dropped Entries 0
 Entry Age-outs 0

eth2
 Frames: Out 15
 In 18
 In Errored 0
 In Dropped 0
 TLVs: Unrecognized 0
 Discarded 0
 Neighbors: New Entries 1
 Deleted Entries 0
 Dropped Entries 0
 Entry Age-outs 0
```

## Parameters in the output of the show lldp statistics interface command

| Parameter                 | Description                                                                                                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Frames Out                | Number of LLDPDU frames transmitted.                                                                                                    |
| Frames In                 | Number of LLDPDU frames received.                                                                                                       |
| Frames In Errored         | Number of invalid LLDPDU frames received.                                                                                               |
| Frames In Dropped         | Number of LLDPDU frames received and discarded for any reason.                                                                          |
| TLVs Unrecognized         | Number of LLDP TLVs received that are not recognized but the TLV type is in the range of reserved TLV types.                            |
| TLVs Discarded            | Number of LLDP TLVs discarded for any reason.                                                                                           |
| Neighbors New Entries     | Number of times the information advertised by neighbors has been inserted into the neighbor table.                                      |
| Neighbors Deleted Entries | Number of times the information advertised by neighbors has been removed from the neighbor table.                                       |
| Neighbors Dropped Entries | Number of times the information advertised by neighbors could not be entered into the neighbor table because of insufficient resources. |

| Parameter                           | Description                                                                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Neighbors Entry<br>Age-outs Entries | Number of times the information advertised by neighbors has been removed from the neighbor table because the information TTL interval has expired. |

**Related commands** [clear lldp statistics](#)  
[show lldp statistics](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V

## show location

**Overview** Use this command to display selected location information configured on the switch.

**Syntax** `show location {civic-location|coord-location|elin-location}`  
`show location {civic-location|coord-location|elin-location}`  
`identifier {<civic-loc-id>|<coord-loc-id>|<elin-loc-id>}`  
`show location {civic-location|coord-location|elin-location}`  
`interface <port-list>`

| Parameter      | Description                                                      |
|----------------|------------------------------------------------------------------|
| civic-location | Display civic location information.                              |
| coord-location | Display coordinate location information.                         |
| elin-location  | Display ELIN (Emergency Location Identifier Number) information. |
| <civic-loc-id> | Civic address location identifier, in the range 1 to 4095.       |
| <coord-loc-id> | Coordinate location identifier, in the range 1 to 4095.          |
| <elin-loc-id>  | ELIN location identifier, in the range 1 to 4095.                |
| <port-list>    | Ports to display information about.                              |

**Mode** User Exec and Privileged Exec

**Examples** To display a civic address location configured on port1.0.1, use the command:

```
awplus# show location civic-location interface port1.0.1
```

**Example output from the show location command**

| Port  | ID | Element Type      | Element Value |
|-------|----|-------------------|---------------|
| 1.0.1 | 1  | Country           | NZ            |
|       |    | City              | Christchurch  |
|       |    | Street-suffix     | Avenue        |
|       |    | House-number      | 27            |
|       |    | Primary-road-name | Nazareth      |

To display coordinate location information configured on the identifier 1, use the command:

```
awplus# show location coord-location identifier 1
```

**Example output from the show location command**

| ID | Element Type         | Element Value                         |
|----|----------------------|---------------------------------------|
| 1  | Latitude Resolution  | 15 bits                               |
|    | Latitude             | 38.8986481130123138427734375 degrees  |
|    | Longitude Resolution | 15 bits                               |
|    | Longitude            | 130.2323232293128967285156250 degrees |
|    | Altitude Resolution  | 10 bits                               |
|    | Altitude             | 2.50000000 meters                     |
|    | Map Datum            | WGS 84                                |

The coordinate location information displayed may differ from the information entered because it is stored in binary format. For more information, see the [location coord-location configuration](#) command.

To display all ELIN location information configured on the switch, use the command:

```
awplus# show location elin-location
```

**Example output from the show location elin-location command**

| ID | ELIN       |
|----|------------|
| 1  | 1234567890 |
| 2  | 5432154321 |

**Related commands**

- [location civic-location identifier](#)
- [location civic-location configuration](#)
- [location coord-location identifier](#)
- [location coord-location configuration](#)
- [location elin-location](#)

**Command changes** Version 5.5.3-1.1: Command added to AR1050V  
Version 5.4.8-2.1: Command added to AR2050V, AR3050S, AR4050S

# 62

## Mail (SMTP) Commands

- Contents**
- **Introduction** on page 3372
  - **debug mail** on page 3373
  - **delete mail** on page 3374
  - **mail** on page 3375
  - **mail from** on page 3377
  - **mail smtpserver** on page 3378
  - **mail smtpserver authentication** on page 3379
  - **mail smtpserver port** on page 3381
  - **mail smtpserver tls** on page 3383
  - **show counter mail** on page 3385
  - **show mail** on page 3386
  - **undebug mail** on page 3387

# Introduction

**Overview** This chapter provides an alphabetical reference for commands used to configure mail. The mail feature uses Simple Mail Transfer Protocol (SMTP) to transfer mail from an internal email client operating within the AlliedWare Plus device. This feature is typically used to email event notifications to an external email server from the AlliedWare Plus device.

For information on using the mail feature, see the **Mail (SMTP) Feature Overview and Configuration Guide**.



# debug mail

**Overview** This command turns on debugging for sending emails.  
The **no** variant of this command turns off debugging for sending emails.

**Syntax** debug mail  
no debug mail

**Mode** Privileged Exec

**Examples** To turn on debugging for sending emails, use the command:  
awplus# debug mail  
To turn off debugging for sending emails, use the command:  
awplus# no debug mail

**Related commands** [delete mail](#)  
[mail](#)  
[mail from](#)  
[mail smtpserver](#)  
[show counter mail](#)  
[show mail](#)  
[undebug mail](#)

# delete mail

**Overview** This command deletes mail from the queue.

You need the *mail-id* from the **show mail** command output to delete specific emails, or use the **all** parameter to clear all messages in the queue completely.

**Syntax** delete mail [mail-id <*mail-id*>|all]

| Parameter | Description                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------|
| mail-id   | Deletes a single mail from the mail queue.                                                                        |
|           | < <i>mail-id</i> > A unique mail ID number. Use the <b>show mail</b> command to display this for an item of mail. |
| all       | Delete all the mail in the queue.                                                                                 |

**Mode** Privileged Exec

**Examples** To delete the unique mail item "20060912142356.1234" from the queue, use the command:

```
awplus# delete mail 20060912142356.1234
```

To delete all mail from the queue, use the command:

```
awplus# delete mail all
```

**Related commands**

- debug mail**
- mail**
- mail from**
- mail smtpserver**
- show mail**

## mail

**Overview** This command sends an email using the SMTP protocol. If you specify a file the text inside the file is sent in the message body.

If you do not specify the **to**, **file**, or **subject** parameters, the CLI prompts you for the missing information.

Before you can send mail using this command, you must specify the sending email address using the **mail from** command and a mail server using the **mail smtpserver** command.

**Syntax** mail [to <to>] [subject <subject>] [file <filename>]

| Parameter | Description                                                                                      |
|-----------|--------------------------------------------------------------------------------------------------|
| to        | The email recipient.                                                                             |
|           | <to> Email address.                                                                              |
| subject   | Description of the subject of this email. Use quote marks when the subject text contains spaces. |
|           | <subject> String.                                                                                |
| file      | File to insert as text into the message body.                                                    |
|           | <filename> String.                                                                               |

**Mode** Privileged Exec

**Usage notes** When you use the **mail** command you can use parameter substitutions in the subject field. The following table lists the parameters that can be substituted and their descriptions:

| Parameter Description |                                                                                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------|
| <%N>                  | When this parameter is specified, the %N is replaced by the host name of your device.                                  |
| <%S>                  | When this parameter is specified, the %S is replaced by the serial number of your device.                              |
| <%D><%L><             | When any of these parameters is specified, they are replaced by the current date and time (local time) on your device. |
| <%U>                  | When this parameter is specified, the %U is replaced by the current date and time (UTC time) on your device.           |

**NOTE:** If no local time is configured, it will use UTC.

**Examples** To send an email to "admin@example.com" with the subject "test email" and with the message body inserted from the file "test.conf", use the command:

```
awplus# mail to admin@example.com subject "test email" filename test.conf
```

To send an email using parameter substitutions for the host name, serial number and date, use the commands:

```
awplus# mail to admin@example.com subject "Sending email from Hostname:%N Serial Number:%S Date:%T"
```

**Related commands**

- [debug mail](#)
- [delete mail](#)
- [mail from](#)
- [mail smtpserver](#)
- [mail smtpserver authentication](#)
- [mail smtpserver port](#)
- [show counter mail](#)
- [show mail](#)

# mail from

**Overview** This command sets an email address as the sender. You must specify a sending email address with this command before you can send email. Use the **no** variant of this command to remove the “mail from” address.

**Syntax** mail from <from>  
no mail from

| Parameter | Description                                                                |
|-----------|----------------------------------------------------------------------------|
| <from>    | The email address that the mail is sent from (also known as the hostname). |

**Mode** Global Configuration

**Example** To set up your email address as the sender “kaji@nerv.com”, use the command:

```
awplus(config)# mail from kaji@nerv.com
```

**Related commands**

- [debug mail](#)
- [delete mail](#)
- [mail](#)
- [mail smtpserver](#)
- [show counter mail](#)
- [show mail](#)
- [undebug mail](#)

# mail smtpserver

**Overview** This command specifies the IP address or domain name of the SMTP server that your device sends email to. You must specify a mail server with this command before you can send email.

Use the **no** variant of this command to remove the configured mail server.

**Syntax** mail smtpserver {<ip-address>|<name>}  
no mail smtpserver

| Parameter    | Description                                                           |
|--------------|-----------------------------------------------------------------------|
| <ip-address> | Internet Protocol (IP) address for the mail server.                   |
| <name>       | Domain name (FQDN) for the mail server (also known as the host name). |

**Mode** Global Configuration

**Usage notes** If you specify the server by specifying its domain name, you must also ensure that the DNS client on your device is enabled. It is enabled by default but if it has been disabled, you can re-enable it by using the **ip domain-lookup** command.

**Examples** To specify a mail server at "192.168.0.1", use the command:

```
awplus(config)# mail smtpserver 192.168.0.1
```

To specify a mail server that has a host name of "smtp.example.com", use the command:

```
awplus(config)# mail smtpserver smtp.example.com
```

To remove the configured mail server, use the command:

```
awplus(config)# no mail smtpserver
```

**Related commands**

- debug mail**
- delete mail**
- mail**
- mail from**
- show counter mail**
- show mail**

# mail smtpserver authentication

**Overview** Use this command to configure SMTP mail server authentication.

Use the **no** variant of this command to remove the configured SMTP mail server authentication.

**Syntax** mail smtpserver authentication {crammd5|login|plain} username <username> password [8] <password>  
no mail smtpserver authentication

| Parameter  | Description                                                                                                                                                                |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| crammd5    | This is a Challenge Request Authentication Mechanism based on the HMAC-MD5 mechanism and is the most secure option.                                                        |
| login      | A BASE64 encryption method                                                                                                                                                 |
| plain      | A BASE64 encryption method                                                                                                                                                 |
| <username> | Registered user name                                                                                                                                                       |
| 8          | The registered user password is presented in an already encrypted format. This is how the running configuration stores the plain text password and is not for general use. |
| <password> | Registered user password                                                                                                                                                   |

**Default** No authentication option is set by default.

**Mode** Global Configuration

**Usage notes** You cannot change the IP address or Domain Name of the SMTP server if authentication is configured. If you attempt to change it when authentication is configured, the following error message is displayed:  
% Error: authentication configuration still exists

**Examples** To configure the SMTP mail server authentication to crammd5, use the commands:

```
awplus# configure terminal
awplus(config)# mail smtpserver authentication crammd5 username
admin password unguessablePassword
```

To remove SMTP mail server authentication, use the commands:

```
awplus# configure terminal
awplus(config)# no mail smtpserver authentication
```

**Output** The following shows typical output.

**Example output from show mail:**

```
awplus#show mail
Mail Settings

State : Alive
SMTP Server : 1.2.3.4
Host Name : admin@example.com
Authentication : crammd5
Username : admin
Debug : Disabled

awplus#show running-config
!
mail smtpserver authentication plain username admin password 8
aF0a9pkjbmXGfl6TlSk/GakeIK5tMYN6LqMYT8Ia2qw=
!
```

**Related commands**

- [debug mail](#)
- [delete mail](#)
- [mail](#)
- [mail from](#)
- [mail smtpserver](#)
- [mail smtpserver port](#)
- [show counter mail](#)
- [show mail](#)

**Command changes** Version 5.4.8-1.1: command added



# mail smtpserver port

**Overview** Use this command to configure the SMTP mail client/server communication port.

Use the **no** variant of this command to remove the configured port and set it back to the default port.

**Syntax** mail smtpserver port <port>  
no mail smtpserver port

| Parameter | Description                           |
|-----------|---------------------------------------|
| <port>    | Port number from the range 1 to 65535 |

**Default** The default port value is 25 if TLS is not enabled for the SMTP server, 587 if TLS is enabled with STARTTLS, and 465 if TLS is enabled with SMTPS.

**Mode** Global Configuration

**Examples** To configure the mail server communication over port 587, use the commands:

```
awplus# configure terminal
awplus(config)# mail smtpserver port 587
```

To revert to the default SMTP mail server communication port, use the commands:

```
awplus# configure terminal
awplus(config)# no mail smtpserver port
```

**Output** The following shows typical output.

**Example output from show mail:**

```
awplus#show mail
Mail Settings

State : Alive
SMTP Server : 10.24.165.4
Host Name : admin@example.com
Authentication : plain
Username : admin
Port : 587
Use TLS : STARTTLS
Debug : Disabled

awplus#show running-config
!
mail smtpserver port 587
!
```

- Related commands

debug mail

delete mail

mail

mail from

mail smtpserver

mail smtpserver tls

show counter mail

show mail

Command changes

Version 5.4.8-1.1: command added

# mail smtpserver tls

**Overview** Use this command to configure the device to send emails over a TLS connection to the SMTP server instead of sending in clear-text. If the SMTP server does not support receiving emails over a TLS connection, sending emails from the device will fail.

Use the **no** variant of this command to configure the device to send emails over an unencrypted TCP connection (clear text).

**Syntax** mail smtpserver tls [starttls|smtps]  
no mail smtpserver tls

| Parameter | Description                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------|
| starttls  | The connection starts as clear-text SMTP first and then the client establishes a TLS connection using the STARTTLS extension. |
| smtps     | Use a TLS connection from the start.                                                                                          |

**Default** By default, TLS is disabled and the device sends emails in clear-text.

**Mode** Global Configuration

**Examples** To send emails to the SMTP server over a TLS connection that will be established by the STARTTLS method, use the commands:

```
awplus# configure terminal
awplus(config)# mail smtpserver tls starttls
```

To send emails to the SMTP server over a TLS connection from the beginning, use the commands:

```
awplus# configure terminal
awplus(config)# mail smtpserver tls smtps
```

To send emails to the SMTP server in clear text, use the commands:

```
awplus# configure terminal
awplus(config)# no mail smtpserver tls
```

**Related commands** [mail](#)  
[show mail](#)  
[mail smtpserver](#)  
[mail smtpserver port](#)  
[mail smtpserver authentication](#)

**Command changes** Version 5.5.3-0.1: command added

# show counter mail

**Overview** This command displays the mail counters.

**Syntax** show counter mail

**Mode** User Exec and Privileged Exec

**Example** To show the emails in the queue use the command:

```
awplus# show counter mail
```

**Output** The following shows typical output.

## Example output from the show counter mail command

```
Mail Client (SMTP) counters
Mails Sent 2
Mails Sent Fails 1
```

## Parameters in the output of the show counter mail command

| Parameter        | Description                                                                   |
|------------------|-------------------------------------------------------------------------------|
| Mails Sent       | The number of emails sent successfully since the last device restart.         |
| Mails Sent Fails | The number of emails the device failed to send since the last device restart. |

**Related commands**

- [debug mail](#)
- [delete mail](#)
- [mail](#)
- [mail from](#)
- [show mail](#)

# show mail

**Overview** This command displays the emails in the queue.

**Syntax** show mail

**Mode** Privileged Exec

**Example** To display the emails in the queue use the command:

```
awplus# show mail
```

**Output** The following shows typical output.

**Example output from the show mail command:**

```
awplus#show mail
Mail Settings

State : Alive
SMTP Server : example.net
Host Name : test@example.com
Authentication : login
Username : admin
Port : 587
Use TLS : STARTTLS
Debug : Disabled

Messages

There is no mail in the queue.
```

**Related commands**

- [delete mail](#)
- [mail](#)
- [mail from](#)
- [mail smtpserver](#)
- [mail smtpserver tls](#)
- [show counter mail](#)
- [mail smtpserver port](#)
- [undebug mail](#)

# undebug mail

**Overview** This command applies the functionality of the no **debug mail**.

# 63

## RMON Commands

- Contents**
- **Introduction** on page 3389
  - **rmon alarm** on page 3390
  - **rmon collection history** on page 3395
  - **rmon collection stats** on page 3397
  - **rmon event** on page 3398
  - **show rmon alarm** on page 3399
  - **show rmon event** on page 3400
  - **show rmon history** on page 3401
  - **show rmon statistics** on page 3403



# Introduction

**Overview** This chapter provides an alphabetical reference for commands used to configure Remote Monitoring (RMON).

For an introduction to RMON and an RMON configuration example, see the [RMON Feature Overview and Configuration Guide](#).

RMON is disabled by default in AlliedWare Plus™. No RMON alarms or events are configured.

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

## rmon alarm

**Overview** Use this command to configure an RMON alarm to monitor the value of an SNMP object, and to trigger specified events when the monitored object crosses specified thresholds.

To specify the action taken when the alarm is triggered, use the event index of an event defined by the **rmon event** command.

Use the **no** variant of this command to remove the alarm configuration.

**NOTE:** *You can only configure alarms for switch port interfaces, not for VLANs.*

### Syntax User-defined alarm:

```
rmon alarm <alarm-index> <oid.index> interval <1-2147483647>
{delta|absolute} rising-threshold <1-2147483647> event <rising-
event-index> falling-threshold <1-2147483647> event <falling-
event-index> [alarmstartup {1|2|3}] [owner <owner>]
```

### Eventwatch alarm, do not use (used by Vista Manager EX only):

```
rmon alarm <alarm-index> <oid.index> interval <1-4294967295>
{delta|absolute} rising-threshold <1-2147483647> event
eventwatch falling-threshold <1-2147483647> event eventwatch
[owner <owner>]
```

```
no rmon alarm <alarm-index>
```

| Parameter                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <alarm-index>                      | Alarm entry index value from the range 1 to 65535 seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <oid.index>                        | <p>The variable SNMP MIB Object Identifier (OID) name to be monitored, for either etherStats or etherHistory entries. The entries can be either of the following formats:</p> <ul style="list-style-type: none"> <li>- etherStatsEntry.&lt;field&gt;.&lt;stats-index&gt; or etherHistoryEntry.&lt;field&gt;.&lt;history-index&gt;, or</li> <li>- etherStatsFieldName.&lt;stats-index&gt; or etherHistoryFieldName.&lt;history-index&gt;.</li> </ul> <p>To define the &lt;stats-index&gt;, use the <b>rmon collection stats</b> command.</p> <p>To define the &lt;history-index&gt;, use the <b>rmon collection history</b> command.</p> |
| interval<br><1-2147483647>         | Polling interval in seconds from the range 1 to 2147483647.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| delta                              | The RMON MIB alarmSampleType: the change in the monitored MIB object value between the beginning and end of the polling interval.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| absolute                           | The RMON MIB alarmSampleType: the value of the monitored MIB object.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| rising-threshold<br><1-2147483647> | Rising threshold value of the alarm entry in seconds from the range 1 to 2147483647.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <rising-event-index>               | From the range 1 to 65535 seconds. The event to be triggered when the monitored object value reaches the rising threshold value. This is the event index of an event specified by the <b>rmon event</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| eventwatch                         | The alarm triggers an eventwatch event. This mechanism is used by Vista Manager EX, the Allied Telesis network management and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Parameter                           | Description                                                                                                                                                                                                                            |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | monitoring tool. Do not use this parameter; use the <i>&lt;rising-event-index&gt;</i> parameter instead.                                                                                                                               |
| falling-threshold<br><1-2147483647> | Falling threshold value of the alarm entry in seconds from the range 1 to 2147483647.                                                                                                                                                  |
| <falling-event-index>               | From the range 1 to 65535 seconds. The event to be triggered when the monitored object value reaches the falling threshold value. This is an event index of an event specified by the <b>rmon event</b> command.                       |
| eventwatch                          | The alarm triggers an eventwatch event. This mechanism is used by Vista Manager EX, the Allied Telesis network management and monitoring tool. Do not use this parameter; use the <i>&lt;rising-event-index&gt;</i> parameter instead. |
| alarmstartup {1\|2\|3}                | Whether RMON can trigger a falling alarm (1), a rising alarm (2) or either (3) when you first start monitoring. See the Usage section for more information.<br><br>The default is setting 3 (either).                                  |
| owner <owner>                       | Arbitrary owner name to identify the alarm entry.                                                                                                                                                                                      |

**Default** By default, there are no alarms.

**Mode** Global Configuration

**Usage notes** RMON alarms have a rising and falling threshold. Once the alarm monitoring is operating, you cannot have a falling alarm unless there has been a rising alarm and vice versa.

However, when you start RMON alarm monitoring, an alarm must be generated without the other type of alarm having first been triggered. The **alarmstartup** parameter allows this. It is used to say whether RMON can generate a rising alarm (1), a falling alarm (2) or either alarm (3) as the first alarm.

Note that you specify the SNMP MIB Object Identifier (OID) as a dotted decimal value, using one of the following forms:

- etherStatsEntry.<field>.<stats-index> or etherHistoryEntry.<field>.<history-index>. For example, etherHistoryEntry.8.8
- or, etherStatsFieldName.<stats-index> or etherHistoryFieldName.<history-index>. For example, etherHistoryMulticastPkts.8

If you enter the first form (etherHistoryEntry.8.8), the device will save it as the second form (etherHistoryMulticastPkts.8) in the running-config.

**Example** To configure an alarm to:

- monitor the change per minute in the etherStatsPkt value for interface 22 (defined by stats-index 22 in the **rmon collection stats** command)
- and trigger event 2 (defined by the **rmon event** command) when the change reaches the rising threshold 400
- and trigger event 3 when it reaches the falling threshold 200
- and identify this alarm as belonging to the user with username Maria

use the following commands:

```
awplus# configure terminal
```

```
awplus(config)# rmon alarm 229 etherStatsEntry.22.5 interval 60
delta rising-threshold 400 event 2 falling-threshold 200 event
3 alarmstartup 3 owner maria
```

To configure an alarm that:

- every 10 seconds, checks the number of multicast packets
- in the latest history control table entry controlled by history-index 8
- to see if the number of packets has increased to 15 or dropped to 5
- and if it has, triggers event 10

use either of the following commands:

```
awplus(config)# rmon alarm 56 etherHistoryMulticastPkts.8
interval 10 absolute rising-threshold 15 event 10 falling-
threshold 5 event 10
```

```
awplus(config)# rmon alarm 56 etherHistoryEntry.8.8 interval 10
absolute rising-threshold 15 event 10 falling-threshold 5 event
10
```

**Related commands** [rmon collection history](#)  
[rmon collection stats](#)  
[rmon event](#)

## rmon collection history

**Overview** Use this command to create a history statistics control group to store a specified number of snapshots (buckets) of the standard RMON statistics for the switch port, and to collect these statistics at specified intervals. If there is sufficient memory available, then the device will allocate memory for storing the set of buckets that comprise this history control.

Use the **no** variant of this command to remove the specified history control configuration.

**NOTE:** A history can only be collected for switch port interfaces, not for VLANs.

**Syntax** `rmon collection history <history-index> [buckets <1-65535>]  
[interval <1-3600>] [owner <owner>]  
no rmon collection history <history-index>`

| Parameter         | Description                                                                                          |
|-------------------|------------------------------------------------------------------------------------------------------|
| <history-index>   | A unique RMON history control entry index value from the range 1 to 65535.                           |
| buckets <1-65535> | Number of requested buckets to store snapshots from the range 1 to 65535. The default is 50 buckets. |
| interval <1-3600> | Polling interval in seconds. Default 1800 second polling interval from the range 1 to 3600.          |
| owner <owner>     | Owner name to identify the entry.                                                                    |

**Default** The default interval is 1800 seconds and the default number of buckets is 50.

**Mode** Interface Configuration

**Example** To create a history statistics control group with ID 200 to store 500 snapshots with an interval of 600 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# rmon collection history 200 buckets 500
interval 600 owner herbert
```

To disable the history statistics control group, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no rmon collection history 200
```

**Related commands** [rmon alarm](#)  
[rmon collection stats](#)  
[rmon event](#)



## rmon collection stats

**Overview** Use this command to enable the collection of RMON statistics on a switch port, and assign an index number by which to access these collected statistics.

Use the **no** variant of this command to stop collecting RMON statistics on this switch port.

**NOTE:** Statistics can only be collected for switch port interfaces, not for VLANs.

**Syntax** `rmon collection stats <collection-index> [owner <owner>]`  
`no rmon collection stats <collection-index>`

| Parameter          | Description                                                                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <collection-index> | Give this collection of statistics an index number to uniquely identify it. This is the index to use to access the statistics collected for this switch port. Use a number in the range of 1 to 65535. |
| owner <owner>      | An arbitrary owner name to identify this statistics collection entry.                                                                                                                                  |

**Default** RMON statistics are not enabled by default.

**Mode** Interface Configuration

**Example** To enable the collection of RMON statistics with a statistics index of 200, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# rmon collection stats 200 owner myrtle
```

To stop collecting RMON statistics, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.2
awplus(config-if)# no rmon collection stats 200
```

**Related commands** [rmon alarm](#)  
[rmon collection history](#)  
[rmon event](#)

## rmon event

**Overview** Use this command to create an event definition for a log or a trap or both. Then you can use this event index in the **rmon alarm** command to indicate whether to send an SNMP trap or log message (or both) when an alarm is triggered.

Use the **no** variant of this command to remove the event definition.

**Syntax** `rmon event <event-index> [description <description>|owner <owner>| trap <trap>]`  
`rmon event <event-index> [log [description <description>|owner <owner>|trap <trap>] ]`  
`rmon event <event-index> [log trap [description <description>|owner <owner>] ]`  
`no rmon event <event-index>`

| Parameter                | Description                               |
|--------------------------|-------------------------------------------|
| <event-index>            | <1-65535> Unique event entry index value. |
| log                      | Log event type.                           |
| trap                     | Trap event type.                          |
| log trap                 | Log and trap event type.                  |
| description<description> | Event entry description.                  |
| owner <owner>            | Owner name to identify the entry.         |

**Default** No event is configured by default.

**Mode** Global Configuration

**Example** To create an event definition with an index of 299 for a log, use this command:

```
awplus# configure terminal
awplus(config)# rmon event 299 log description cond3 owner
alfred
```

To remove the event definition, use the command:

```
awplus# configure terminal
awplus(config)# no rmon event 299
```

**Related commands** **rmon alarm**

# show rmon alarm

**Overview** Use this command to display the alarms and threshold configured for the RMON probe.

**Syntax** show rmon alarm

**Mode** User Exec and Privileged Exec

**Example** To display the alarms and threshold, use this command:

```
awplus# show rmon alarm
```

**Related commands** [rmon alarm](#)

# show rmon event

**Overview** Use this command to display the events configured for the RMON probe.

**Syntax** show rmon event

**Mode** User Exec and Privileged Exec

**Output** The following shows typical output.

## Example output from the show rmon event command

```
awplus#sh rmon event
event Index = 787
 Description TRAP
 Event type log & trap
 Event community name gopher
 Last Time Sent = 0
 Owner RMON_SNMP

event Index = 990
 Description TRAP
 Event type trap
 Event community name teabo
 Last Time Sent = 0
 Owner RMON_SNMP
```

**NOTE:** The following etherStats counters are not currently available for Layer 3 interfaces:

- etherStatsBroadcastPkts
- etherStatsCRCAlignErrors
- etherStatsUndersizePkts
- etherStatsOversizePkts
- etherStatsFragments
- etherStatsJabbers
- etherStatsCollisions
- etherStatsPkts64Octets
- etherStatsPkts65to127Octets
- etherStatsPkts128to255Octets
- etherStatsPkts256to511Octets
- etherStatsPkts512to1023Octets
- etherStatsPkts1024to1518Octets

**Example** To display the events configured for the RMON probe, use this command:

```
awplus# show rmon event
```

**Related commands** [rmon event](#)

# show rmon history

**Overview** Use this command to display the parameters specified on all the currently defined RMON history collections on the device.

**Syntax** show rmon history

**Mode** User Exec and Privileged Exec

**Output** The following shows typical output.

## Example output from the show rmon history command

```
awplus#sh rmon history
 history index = 56
 data source ifindex = 4501
 buckets requested = 34
 buckets granted = 34
 Interval = 2000
 Owner Andrew

 history index = 458
 data source ifindex = 5004
 buckets requested = 400
 buckets granted = 400
 Interval = 1500
 Owner trev
=====
```

**NOTE:** The following etherStats counters are not currently available for Layer 3 interfaces:

- etherStatsBroadcastPkts
- etherStatsCRCAlignErrors
- etherStatsUndersizePkts
- etherStatsOversizePkts
- etherStatsFragments
- etherStatsJabbers
- etherStatsCollisions
- etherStatsPkts64Octets
- etherStatsPkts65to127Octets
- etherStatsPkts128to255Octets
- etherStatsPkts256to511Octets
- etherStatsPkts512to1023Octets
- etherStatsPkts1024to1518Octets

**Example** To display the parameters specified on all the currently defined RMON history collections, us the commands:

```
awplus# show rmon history
```

**Related commands** [rmon collection history](#)

# show rmon statistics

**Overview** Use this command to display the current values of the statistics for all the RMON statistics collections currently defined on the device.

**Syntax** show rmon statistics

**Mode** User Exec and Privileged Exec

**Example** To display the current values of the statistics for all the RMON statistics collections, use the commands:

```
awplus# show rmon statistics
```

**Output** The following shows typical output.

## Example output from the show rmon statistics command

```
awplus#show rmon statistics
 rmon collection index 45
 stats->ifindex = 4501
 input packets 1279340, bytes 85858960, dropped 00, multicast packets 1272100
 output packets 7306090, bytes 268724, multicast packets 7305660 broadcast
 packets 290
 rmon collection index 679
 stats->ifindex = 5013
 input packets 00, bytes 00, dropped 00, multicast packets 00
 output packets 8554550, bytes 26777324, multicast packets 8546690 broadcast
 packets 7720
```

**NOTE:** The following etherStats counters are not currently available for Layer 3 interfaces:

- etherStatsBroadcastPkts
- etherStatsCRCAlignErrors
- etherStatsUndersizePkts
- etherStatsOversizePkts
- etherStatsFragments
- etherStatsJabbers
- etherStatsCollisions
- etherStatsPkts64Octets
- etherStatsPkts65to127Octets
- etherStatsPkts128to255Octets
- etherStatsPkts256to511Octets
- etherStatsPkts512to1023Octets
- etherStatsPkts1024to1518Octets

**Related commands** [rmon collection stats](#)

# 64

## Secure Shell (SSH) Commands

- Contents**
- **Introduction** on page 3406
  - **banner login (SSH)** on page 3407
  - **clear ssh** on page 3408
  - **crypto key destroy hostkey** on page 3409
  - **crypto key destroy userkey** on page 3410
  - **crypto key generate hostkey** on page 3411
  - **crypto key generate userkey** on page 3413
  - **crypto key pubkey-chain knownhosts** on page 3415
  - **crypto key pubkey-chain userkey** on page 3417
  - **debug ssh client** on page 3419
  - **debug ssh server** on page 3420
  - **service ssh** on page 3421
  - **show banner login** on page 3423
  - **show crypto key hostkey** on page 3424
  - **show crypto key pubkey-chain knownhosts** on page 3426
  - **show crypto key pubkey-chain userkey** on page 3428
  - **show crypto key userkey** on page 3430
  - **show running-config ssh** on page 3432
  - **show ssh** on page 3434
  - **show ssh client** on page 3437
  - **show ssh server** on page 3438
  - **show ssh server allow-users** on page 3441
  - **show ssh server deny-users** on page 3442
  - **ssh** on page 3443
  - **ssh client** on page 3446
  - **ssh client allow-legacy-ssh-rsa** on page 3449
  - **ssh server** on page 3450
  - **ssh server allow-legacy-ssh-rsa** on page 3452
  - **ssh server allow-users** on page 3453
  - **ssh server authentication** on page 3455
  - **ssh server deny-users** on page 3457
  - **ssh server disallow-cbc-ciphers** on page 3459
  - **ssh server max-auth-tries** on page 3460
  - **ssh server resolve-host** on page 3461
  - **ssh server scp** on page 3462
  - **ssh server secure-algs** on page 3463
  - **ssh server secure-ciphers** on page 3464



- **ssh server secure-hostkey** on page 3465
- **ssh server secure-kex** on page 3466
- **ssh server secure-mac** on page 3468
- **ssh server sftp** on page 3469
- **ssh server tcpforwarding** on page 3470
- **undebug ssh client** on page 3471
- **undebug ssh server** on page 3472

# Introduction

**Overview** This chapter provides an alphabetical reference for commands used to configure Secure Shell (SSH). For more information, see the **SSH Feature Overview and Configuration Guide**.

## banner login (SSH)

**Overview** This command configures a login banner on the SSH server. This displays a message on the remote terminal of the SSH client before the login prompt. SSH client version 1 does not support this banner.

To add a banner, first enter the command **banner login**, and hit [Enter]. Write your message. You can use any character and spaces. Use Ctrl +D at the end of your message to save the text and re-enter the normal command line mode.

The banner message is preserved if the device restarts.

The **no** variant of this command deletes the login banner from the device.

**Syntax** banner login  
no banner login

**Default** No banner is defined by default.

**Mode** Global Configuration

**Examples** To set a login banner message, use the commands:

```
awplus# configure terminal
awplus(config)# banner login
```

The screen will prompt you to enter the message:

Type CNTL/D to finish.

... banner message comes here ...

Enter the message. Use Ctrl+D to finish, like this:

^D

```
awplus(config)#
```

To remove the login banner message, use the commands:

```
awplus# configure terminal
awplus(config)# no banner login
```

**Related commands** [show banner login](#)

## clear ssh

**Overview** This command deletes Secure Shell sessions currently active on the device. This includes both incoming and outgoing sessions. The deleted sessions are closed. You can only delete an SSH session if you are a system manager or the user who initiated the session. If **all** is specified then all active SSH sessions are deleted.

**Syntax** `clear ssh {<1-65535>|all}`

| Parameters | Description                                                                |
|------------|----------------------------------------------------------------------------|
| <1-65535>  | Specify a session ID in the range 1 to 65535 to delete a specific session. |
| all        | Delete all SSH sessions.                                                   |

**Mode** Privileged Exec

**Examples** To stop the current SSH session 123, use the command:

```
awplus# clear ssh 123
```

To stop all SSH sessions active on the device, use the command:

```
awplus# clear ssh all
```

**Related commands** [service ssh](#)  
[ssh](#)

# crypto key destroy hostkey

**Overview** This command deletes the existing public and private keys of the SSH server.

**Syntax** `crypto key destroy hostkey {dsa|ecdsa|ed25519|rsa|rsa1}`

| Parameters | Description                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dsa        | Deletes the existing DSA public and private keys.                                                                                                                                    |
| ecdsa      | Deletes the existing ECDSA public and private keys.                                                                                                                                  |
| ed25519    | Deletes the existing Ed25519 public and private keys.                                                                                                                                |
| rsa        | Deletes the existing RSA public and private keys that were configured for SSH version 2 connections.                                                                                 |
| rsa1       | Deletes the existing RSA public and private keys that were configured for SSH version 1 connections. From AlliedWare Plus version 5.5.1-1.1 onwards, SSH version 1 is not supported. |

**Mode** Global Configuration

**Example** To destroy the RSA host key used for SSH version 2 connections, use the commands:

```
awplus# configure terminal
awplus(config)# crypto key destroy hostkey rsa
```

**Related commands** [crypto key generate hostkey](#)  
[service ssh](#)

**Command changes** Version 5.5.2-2.1: **ed25519** parameter added

# crypto key destroy userkey

**Overview** This command destroys the existing public and private keys of an SSH user configured on the device.

**Syntax** `crypto key destroy userkey <username> {dsa|ecdsa|ed25519|rsa|rsa1}`

| Parameters | Description                                                                                                                                                                            |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <username> | Name of the user whose userkey you are destroying. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen and full stop symbols. |
| dsa        | Deletes the existing DSA userkey.                                                                                                                                                      |
| ecdsa      | Deletes the existing ECDSA userkey.                                                                                                                                                    |
| ed25519    | Deletes the existing Ed25519 userkey.                                                                                                                                                  |
| rsa        | Deletes the existing RSA userkey that was configured for SSH version 2 connections.                                                                                                    |
| rsa1       | Deletes the existing RSA userkey that was configured for SSH version 1 connections. From AlliedWare Plus version 5.5.1-1.1 onwards, SSH version 1 is not supported.                    |

**Mode** Global Configuration

**Example** To destroy the RSA user key for the SSH user remoteuser, use the commands:

```
awplus# configure terminal
awplus(config)# crypto key destroy userkey remoteuser rsa
```

**Related commands**

- [crypto key generate hostkey](#)
- [crypto key generate userkey](#)
- [show ssh](#)
- [show crypto key hostkey](#)

**Command changes** Version 5.5.2-2.1: **ed25519** parameter added

# crypto key generate hostkey

**Overview** This command generates public and private keys for the SSH server.

When you enable the SSH server, if no host keys exist, the server automatically generates SSHv2 host key pairs using Ed25519 with a keysize of 256, ECDSA with a curve length of 384, and RSA with a 3072-bit key (unless in secure mode, when it only generates the ECDSA key).

If you need a key with different parameters than this, you can use this command to generate that key before you enable the SSH server. If a host key exists with the same cryptography algorithm, this command replaces the old host key with the new key.

This command is not saved in the device configuration. However, the device saves the keys generated by this command in the non-volatile memory.

**Syntax** `crypto key generate hostkey rsa [<1024-16384>]`  
`crypto key generate hostkey ecdsa [<256|384|521>]`  
`crypto key generate hostkey ed25519`

| Parameters    | Description                                       |
|---------------|---------------------------------------------------|
| rsa           | Creates an RSA hostkey.                           |
| ecdsa         | Creates an ECDSA hostkey.                         |
| ed25519       | Creates an Ed25519 hostkey with a keysize of 256. |
| <1024-16384>  | The length in bits of the generated key.          |
| <256\|384\|521> | The ECDSA key size in bits.                       |

**Default** The default key length for RSA is 3072 bits.  
The default key size for ECDSA is 384 bits.

**Mode** Global Configuration

**Examples** To generate an RSA host key that is 4096 bits in length, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# crypto key generate hostkey rsa 4096
```

To generate an ECDSA host key with an elliptic curve size of 521 bits, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# crypto key generate hostkey ecdsa 521
```

To generate an Ed25519 host key with a keysize of 256, use the commands:

```
awplus# configure terminal
```

```
awplus(config)# crypto key generate hostkey ed25519
```

**Related commands** [crypto key destroy hostkey](#)  
[service ssh](#)  
[show crypto key hostkey](#)

**Command changes** Version 5.5.5-1.1: default RSA key length increased to 3072  
Version 5.5.2-2.1: **ed25519** parameter added  
Version 5.5.2-0.1: changes to key length and key size ranges and defaults  
Version 5.5.1-1.1: support removed for the ssh-rsa algorithm in OpenSSH and for SSH protocol v1



# crypto key generate userkey

**Overview** This command generates public and private keys for an SSH user using an RSA, ECDSA, or ED25519 cryptography algorithm. To use public key authentication, copy the public key of the user onto the remote SSH server.

This command is not saved in the device configuration. However, the device saves the keys generated by this command in the non-volatile memory.

**Syntax** `crypto key generate userkey <username> rsa [<1024-16384>]`  
`crypto key generate userkey <username> ecdsa [<256|384|521>]`  
`crypto key generate userkey <username> ed25519`

| Parameters    | Description                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <username>    | Name of the user that the user key is generated for. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen and full stop symbols. |
| rsa           | Creates an RSA userkey.                                                                                                                                                                  |
| ecdsa         | Creates an ECDSA userkey.                                                                                                                                                                |
| ed25519       | Creates an Ed25519 userkey with a keysize of 256.                                                                                                                                        |
| <1024-16384>  | The length in bits of the generated key. The default is 2048 bits.                                                                                                                       |
| <256\|384\|521> | The ECDSA key size in bits. The default is 384.                                                                                                                                          |

**Default** The default key length for RSA is 2048 bits.  
The default key size for ECDSA is 384 bits.

**Mode** Global Configuration

**Examples** To generate a 4096-bit RSA user key for SSH version 2 connections for the user 'bob', use the commands:

```
awplus# configure terminal
awplus(config)# crypto key generate userkey bob rsa 4096
```

To generate an ECDSA user key of key size 521 for the user 'lapo', use the commands:

```
awplus# configure terminal
awplus(config)# crypto key generate userkey lapo ecdsa 521
```

To generate an Ed25519 user key of key size 256 for the user 'lapo', use the commands:

```
awplus# configure terminal
awplus(config)# crypto key generate userkey lapo ed25519
```

**Related commands** [crypto key pubkey-chain userkey](#)  
[show crypto key userkey](#)

**Command changes** Version 5.5.2-2.1: **ed25519** parameter added  
Version 5.5.2-0.1: changes to key length and key size ranges and defaults  
Version 5.5.1-1.1: support removed for the ssh-rsa algorithm in OpenSSH and for SSH protocol v1

# crypto key pubkey-chain knownhosts

**Overview** This command adds a public key of the specified SSH server to the known host database on your device. The SSH client on your device uses this public key to verify the remote SSH server.

The key is retrieved from the server. Before adding a key to this database, check that the key sent to you is correct.

If the server's key changes, or if your SSH client does not have the public key of the remote SSH server, then your SSH client will inform you that the public key of the server is unknown or altered.

The **no** variant of this command deletes the public key of the specified SSH server from the known host database on your device.

**Syntax** `crypto key pubkey-chain knownhosts [ip|ipv6] <hostname> [ecdsa|rsa]`  
`no crypto key pubkey-chain knownhosts <1-65535>`

| Parameter  | Description                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| ip         | Keyword used prior to specifying an IPv4 address                                                                                           |
| ipv6       | Keyword used prior to specifying an IPv6 address                                                                                           |
| <hostname> | IPv4/IPv6 address or hostname of a remote server in the format a.b.c.d for an IPv4 address, or in the format x:x::x:x for an IPv6 address. |
| ecdsa      | Specify the ECDSA public key of the server to be added to the known host database.                                                         |
| rsa        | Specify the RSA public key of the server to be added to the known host database.                                                           |
| <1-65535>  | Specify a key identifier when removing a key using the <b>no</b> parameter.                                                                |

**Default** If no cryptography algorithm is specified, then **rsa** is used as the default cryptography algorithm.

**Mode** Privilege Exec

**Usage notes** This command adds a public key of the specified SSH server to the known host database on the device. The key is retrieved from the server. The remote SSH server is verified by using this public key. The user is requested to check the key is correct before adding it to the database.

If the remote server's host key is changed, or if the device does not have the public key of the remote server, then SSH clients will inform the user that the public key of the server is altered or unknown.

**Examples** To add the RSA host key of the remote SSH host IPv4 address 192.0.2.11 to the known host database, use the command:

```
awplus# crypto key pubkey-chain knownhosts 192.0.2.11
```

To delete the second entry in the known host database, use the command:

```
awplus# no crypto key pubkey-chain knownhosts 2
```

**Validation** **show crypto key pubkey-chain knownhosts**  
**Commands**

# crypto key pubkey-chain userkey

**Overview** This command adds a public key for an SSH user on the SSH server. This allows the SSH server to support public key authentication for the SSH user. When configured, the SSH user can access the SSH server without providing a password from the remote host.

The **no** variant of this command removes a public key for the specified SSH user that has been added to the public key chain. When a SSH user's public key is removed, the SSH user can no longer login using public key authentication.

**Syntax** `crypto key pubkey-chain userkey <username> [<filename>]`  
`no crypto key pubkey-chain userkey <username> <1-65535>`

| Parameters | Description                                                                                                                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <username> | Name of the user that the SSH server associates the key with. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen and full stop symbols.<br><br>Default: no default |
| <filename> | Filename of a key saved in flash. Valid characters are any printable character. You can add a key as a hexadecimal string directly into the terminal if you do not specify a filename.                                       |
| <1-65535>  | The key ID number of the user's key. Specify the key ID to delete a key.                                                                                                                                                     |

**Mode** Global Configuration

**Usage notes** You should import the public key file from the client node. The device can read the data from a file on the flash or user terminal.

Or you can add a key as text into the terminal. To add a key as text into the terminal, first enter the command **crypto key pubkey-chain userkey <username>**, and hit [Enter]. Enter the key as text. Note that the key you enter as text must be a valid SSH RSA key, not random ASCII text. Use [Ctrl]+D after entering it to save the text and re-enter the normal command line mode.

Note you can generate a valid SSH RSA key on the device first using the **crypto key generate host rsa** command. View the SSH RSA key generated on the device using the **show crypto hostkey rsa** command. Copy and paste the displayed SSH RSA key after entering the **crypto key pubkey-chain userkey <username>** command. Use [Ctrl]+D after entering it to save it.

**Examples** To generate a valid SSH RSA key on the device and add the key, use the following commands:

```
awplus# configure terminal
awplus(config)# crypto key generate host rsa
awplus(config)# exit

awplus# show crypto key hostkey
rsaAAAAB3NzaC1yc2EAAAABIwAAAIEAr1s7SokW5aw2fc0w1TStpb9J20bWluhnUC768EoWhyP
+7jtjDcoGWHb2u4sFwRpXwJZcgYrXW16+6NvNbk+h+c/
pqGDijj4SvfZZfeITzvvyZW4/I4pbN8=

awplus# configure terminal
awplus(config)# crypto key pubkey-
chain userkey joeType CNTRL/D to
finish:AAAAB3NzaC1yc2EAAAABIwAAAIEAr1s7SokW5aw2fc0w1TStpb9J20bWluhnUC768Eo
+7jtjDcoGWHb2u4sFwRpXwJZcgYrXW16+6NvNbk+h+c/
pqGDijj4SvfZZfeITzvvyZW4/I4pbN8=control-D
awplus(config)#
```

To add a public key for the user graydon from the file key.pub, use the commands:

```
awplus# configure terminal
awplus(config)# crypto key pubkey-chain userkey graydon key.pub
```

To add a public key for the user tamara from the terminal, use the commands:

```
awplus# configure terminal
awplus(config)# crypto key pubkey-chain userkey tamara
```

and enter the key. Use Ctrl+D to finish.

To remove the first key entry from the public key chain of the user john, use the commands:

```
awplus# configure terminal
awplus(config)# no crypto key pubkey-chain userkey john 1
```

**Related commands** [show crypto key pubkey-chain userkey](#)

# debug ssh client

**Overview** This command enables the SSH client debugging facility. When enabled, any SSH, SCP and SFTP client sessions send diagnostic messages to the login terminal.

The **no** variant of this command disables the SSH client debugging facility. This stops the SSH client from generating diagnostic debugging message.

**Syntax** debug ssh client [brief|full]  
no debug ssh client

| Parameter | Description               |
|-----------|---------------------------|
| brief     | Enables brief debug mode. |
| full      | Enables full debug mode.  |

**Default** SSH client debugging is disabled by default.

**Mode** Privileged Exec and Global Configuration

**Examples** To start SSH client debugging, use the command:

```
awplus# debug ssh client
```

To start SSH client debugging with extended output, use the command:

```
awplus# debug ssh client full
```

To disable SSH client debugging, use the command:

```
awplus# no debug ssh client
```

**Related commands** [debug ssh server](#)  
[show ssh client](#)  
[undebug ssh client](#)

**Command changes** Version 5.5.3-1.1: added to AR1050V

# debug ssh server

**Overview** This command enables the SSH server debugging facility. When enabled, the SSH server sends diagnostic messages to the system log. To display the debugging messages on the terminal, use the **terminal monitor** command.

The **no** variant of this command disables the SSH server debugging facility. This stops the SSH server from generating diagnostic debugging messages.

**Syntax** debug ssh server [brief|full]  
no debug ssh server

| Parameter | Description               |
|-----------|---------------------------|
| brief     | Enables brief debug mode. |
| full      | Enables full debug mode.  |

**Default** SSH server debugging is disabled by default.

**Mode** Privileged Exec and Global Configuration

**Examples** To start SSH server debugging, use the command:

```
awplus# debug ssh server
```

To start SSH server debugging with extended output, use the command:

```
awplus# debug ssh server full
```

To disable SSH server debugging, use the command:

```
awplus# no debug ssh server
```

**Related commands** **debug ssh client**  
**show ssh server**  
**undebug ssh server**



## service ssh

**Overview** Use this command to enable the Secure Shell server on the device. Once enabled, connections coming from SSH clients are accepted.

When you enable the SSH server, if no host keys exist, the server automatically generates SSHv2 host key pairs using ECDSA with a curve length of 384, and RSA with a 1024-bit key (unless in secure mode, when it only generates the ECDSA key).

If you need a key with different parameters than this, you can use the **crypto key generate hostkey** command to generate that key before you enable the SSH server.

Use the **no** variant of this command to disable the Secure Shell server. When the Secure Shell server is disabled, connections from SSH, SCP, and SFTP clients are not accepted. This command does not affect existing SSH sessions. To terminate existing sessions, use the **clear ssh** command.

**Syntax** `service ssh [ip|ipv6]`  
`no service ssh [ip|ipv6]`

**Default** The Secure Shell server is disabled by default. Both IPv4 and IPv6 Secure Shell server are enabled when you issue **service ssh** without specifying the optional **ip** or **ipv6** parameters.

The server supports SSH version 2 only (not SSH version 1).

**Mode** Global Configuration

**Examples** To enable both the IPv4 and the IPv6 Secure Shell server, use the commands:

```
awplus# configure terminal
awplus(config)# service ssh
```

To enable the IPv4 Secure Shell server only, use the commands:

```
awplus# configure terminal
awplus(config)# service ssh ip
```

To enable the IPv6 Secure Shell server only, use the commands:

```
awplus# configure terminal
awplus(config)# service ssh ipv6
```

To disable both the IPv4 and the IPv6 Secure Shell server, use the commands:

```
awplus# configure terminal
awplus(config)# no service ssh
```

To disable the IPv4 Secure Shell server only, use the commands:

```
awplus# configure terminal
awplus(config)# no service ssh ip
```

To disable the IPv6 Secure Shell server only, use the commands:

```
awplus# configure terminal
awplus(config)# no service ssh ipv6
```

**Related commands**

- [\*\*crypto key generate hostkey\*\*](#)
- [\*\*show running-config ssh\*\*](#)
- [\*\*show ssh server\*\*](#)
- [\*\*ssh server allow-users\*\*](#)
- [\*\*ssh server deny-users\*\*](#)

**Command changes** Version 5.5.1-1.1: support removed for the ssh-rsa algorithm in OpenSSH and for SSH protocol v1

# show banner login

**Overview** This command displays the banner message configured on the device. The banner message is displayed to the remote user before user authentication starts.

**Syntax** show banner login

**Mode** User Exec, Privileged Exec, Global Configuration, Interface Configuration, Line Configuration

**Example** To display the current login banner message, use the command:  
awplus# show banner login

**Related commands** [banner login \(SSH\)](#)

# show crypto key hostkey

**Overview** This command displays the public keys generated on the device for the SSH server.

When you enable the SSH server, if no host keys exist, the server automatically generates SSHv2 host key pairs using Ed25519 with a keysize of 256, ECDSA with a curve length of 384, and RSA with a 3072-bit key (unless in secure mode, when it only generates the ECDSA key).

The private key remains on the device secretly. The public key is copied to SSH clients to identify the server. This command displays the public key.

**Syntax** show crypto key hostkey [ecdsa|ed25519|rsa]

| Parameter | Description                                                          |
|-----------|----------------------------------------------------------------------|
| ecdsa     | Displays the ECDSA algorithm public key.                             |
| ed25519   | Displays the Ed25519 algorithm public key.                           |
| rsa       | Displays the RSA algorithm public key for SSH version 2 connections. |

**Mode** User Exec, Privileged Exec and Global Configuration

**Examples** To show the public keys generated on the device for SSH server, use the command:

```
awplus# show crypto key hostkey
```

To display the RSA public key of the SSH server, use the command:

```
awplus# show crypto key hostkey rsa
```

**Output** The following shows typical output.

**Example output from the show crypto key hostkey command**

| Type                                               | Bits | Fingerprint |
|----------------------------------------------------|------|-------------|
| -----                                              |      |             |
| rsa                                                | 2048 |             |
| SHA256:K7hes31yK6uuN04sprZtFcyX9sUuXP42gou110348n8 |      |             |
| ecdsa                                              | 384  |             |
| SHA256:qhBXhkcUCC6FKwy3+pRlrRs0NtZhibreqDv9vLs9tVQ |      |             |
| ed25519                                            | 256  |             |
| SHA256:S8e/9WjCZHsUTEAHMYkIKEoxusmrLOIGe2oSs34clbA |      |             |

**Parameters in output of the show crypto key hostkey command**

| Parameter   | Description                         |
|-------------|-------------------------------------|
| Type        | Algorithm used to generate the key. |
| Bits        | Length in bits of the key.          |
| Fingerprint | Checksum value for the public key.  |

**Related commands** [crypto key destroy hostkey](#)  
[crypto key generate hostkey](#)

# show crypto key pubkey-chain knownhosts

**Overview** This command displays the list of public keys maintained in the known host database on the device.

**Syntax** show crypto key pubkey-chain knownhosts [<1-65535>]

| Parameter | Description                                                                           |
|-----------|---------------------------------------------------------------------------------------|
| <1-65535> | Key identifier for a specific key. Displays the public key of the entry if specified. |

**Default** Display all keys.

**Mode** User Exec, Privileged Exec and Global Configuration

**Examples** To display public keys of known SSH servers, use the command:

```
awplus# show crypto key pubkey-chain knownhosts
```

To display the key data of the first entry in the known host data, use the command:

```
awplus# show crypto key pubkey-chain knownhosts 1
```

**Output** The following shows typical output.

**Example output from the show crypto key public-chain knownhosts command**

| No | Hostname                                 | Type | Fingerprint                                     |
|----|------------------------------------------|------|-------------------------------------------------|
| 1  | 172.16.23.1                              | rsa  | c8:33:b1:fe:6f:d3:8c:81:4e:f7:2a:aa:a5:be:df:18 |
| 2  | 172.16.23.10                             | rsa  | c4:79:86:65:ee:a0:1d:a5:6a:e8:fd:1d:d3:4e:37:bd |
| 3  | 5ffe:1053:ac21:ff00:0101:bcd:f:ffff:0001 | rsa1 | af:4e:b4:a2:26:24:6d:65:20:32:d9:6f:32:06:ba:57 |

**Parameters in the output of the show crypto key public-chain knownhosts command**

| Parameter   | Description                             |
|-------------|-----------------------------------------|
| No          | Number ID of the key.                   |
| Hostname    | Host name of the known SSH server.      |
| Type        | The algorithm used to generate the key. |
| Fingerprint | Checksum value for the public key.      |

**Related commands** [crypto key pubkey-chain knownhosts](#)

**Command changes** Version 5.5.3-1.1: added to AR1050V  
Version 5.4.6-2.1: VRF-lite support added for AR-Series devices

# show crypto key pubkey-chain userkey

**Overview** This command displays the public keys registered with the SSH server for SSH users. These keys allow remote users to access the device using public key authentication. By using public key authentication, users can access the SSH server without providing password.

**Syntax** show crypto key pubkey-chain userkey <username> [<1-65535>]

| Parameter  | Description                                                                                                                                                                                          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <username> | User name of the remote SSH user whose keys you wish to display. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen and full stop symbols. |
| <1-65535>  | Key identifier for a specific key.                                                                                                                                                                   |

**Default** Display all keys.

**Mode** User Exec, Privileged Exec and Global Configuration

**Example** To display the public keys for the user manager that are registered with the SSH server, use the command:

```
awplus# show crypto key pubkey-chain userkey manager
```

**Output** The following shows typical output.

**Example output from the show crypto key public-chain userkey command**

| No | Type | Bits | Fingerprint                                     |
|----|------|------|-------------------------------------------------|
| 1  | dsa  | 1024 | 2b:cc:df:a8:f8:2e:8f:a4:a5:4f:32:ea:67:29:78:fd |
| 2  | rsa  | 2048 | 6a:ba:22:84:c1:26:42:57:2c:d7:85:c8:06:32:49:0e |

**Parameters in the output of the show crypto key userkey command**

| Parameter   | Description                             |
|-------------|-----------------------------------------|
| No          | Number ID of the key.                   |
| Type        | The algorithm used to generate the key. |
| Bits        | Length in bits of the key.              |
| Fingerprint | Checksum value for the key.             |



**Related commands** [crypto key pubkey-chain userkey](#)

# show crypto key userkey

**Overview** This command displays the public keys created on this device for the specified SSH user.

**Syntax** show crypto key userkey <username> [dsa|rsa|rsa1]

| Parameter  | Description                                                                                                                                                                                         |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <username> | User name of the local SSH user whose keys you wish to display. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen and full stop symbols. |
| dsa        | Displays the DSA public key.                                                                                                                                                                        |
| rsa        | Displays the RSA public key used for SSH version 2 connections.                                                                                                                                     |
| rsa1       | Displays the RSA key used for SSH version 1 connections.                                                                                                                                            |

**Mode** User Exec, Privileged Exec and Global Configuration

**Examples** To show the public key generated for the user, use the command:

```
awplus# show crypto key userkey manager
```

To store the RSA public key generated for the user manager to the file "user.pub", use the command:

```
awplus# show crypto key userkey manager rsa > manager-rsa.pub
```

**Output** The following shows typical output.

## Example output from the show crypto key userkey command

| Type | Bits | Fingerprint                                     |
|------|------|-------------------------------------------------|
| rsa  | 2048 | e8:d6:1b:c0:f4:b6:e6:7d:02:2e:a9:d4:a1:ca:3b:11 |
| rsa1 | 1024 | 12:25:60:95:64:08:8e:a1:8c:3c:45:1b:44:b9:33:9b |

## Parameters in the output of the show crypto key userkey command

| Parameter   | Description                             |
|-------------|-----------------------------------------|
| Type        | The algorithm used to generate the key. |
| Bits        | Length in bits of the key.              |
| Fingerprint | Checksum value for the key.             |

**Related commands** [crypto key generate userkey](#)

# show running-config ssh

**Overview** This command displays the current running configuration of Secure Shell (SSH).

**Syntax** show running-config ssh

**Mode** Privileged Exec and Global Configuration

**Example** To display the current configuration of SSH, use the command:  
awplus# show running-config ssh

**Output** The following shows typical output.

**Example output from the show running-config ssh command**

```
!
ssh server session-timeout 600
ssh server login-timeout 30
ssh server allow-users manager 192.168.1.*
ssh server allow-users john
ssh server deny-user john*.a-company.com
ssh server
```

**Parameters in the output of the show running-config ssh command**

| Parameter                              | Description                                                                 |
|----------------------------------------|-----------------------------------------------------------------------------|
| ssh server                             | SSH server is enabled.                                                      |
| ssh server v2                          | SSH server is enabled and only support SSHv2.                               |
| ssh server<port>                       | SSH server is enabled and listening on the specified TCP port.              |
| no ssh server scp                      | SCP service is disabled.                                                    |
| no ssh server sftp                     | SFTP service is disabled.                                                   |
| ssh server session-timeout             | Configure the server session timeout.                                       |
| ssh server login-timeout               | Configure the server login timeout.                                         |
| ssh server max-startups                | Configure the maximum number of concurrent sessions waiting authentication. |
| no ssh server authentication password  | Password authentication is disabled.                                        |
| no ssh server authentication publickey | Public key authentication is disabled.                                      |
| ssh server allow-users                 | Add the user (and hostname) to the allow list.                              |
| ssh server deny-users                  | Add the user (and hostname) to the deny list.                               |

**Related commands** [service ssh](#)  
[show ssh server](#)

## show ssh

**Overview** This command displays the active SSH sessions on the device, both incoming and outgoing.

**Syntax** show ssh

**Mode** User Exec, Privileged Exec and Global Configuration

**Example** To display the current SSH sessions on the device, use the command:  
awplus# show ssh

**Output** The following shows typical output.

**Example output from the show ssh command**

| Secure Shell Sessions: |      |        |                                         |          |           |             |  |
|------------------------|------|--------|-----------------------------------------|----------|-----------|-------------|--|
| ID                     | Type | Mode   | Peer Host                               | Username | State     | Filename    |  |
| 414                    | ssh  | server | 172.16.23.1                             | root     | open      |             |  |
| 456                    | ssh  | client | 172.16.23.10                            | manager  | user-auth |             |  |
| 459                    | scp  | client | 172.16.23.12                            | root     | download  | example.awd |  |
| 463                    | ssh  | client | 5ffe:33fe:5632:ffbb:bc35:ddee:0101:ac51 | manager  | user-auth |             |  |

**Parameters in the output of the show ssh command**

| Parameter | Description                                                                                              |                                                 |
|-----------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| ID        | Unique identifier for each SSH session.                                                                  |                                                 |
| Type      | Session type; either SSH, SCP, or SFTP.                                                                  |                                                 |
| Mode      | Whether the device is acting as an SSH client (client) or SSH server (server) for the specified session. |                                                 |
| Peer Host | The hostname or IP address of the remote server or client.                                               |                                                 |
| Username  | Login user name of the server.                                                                           |                                                 |
| State     | The current state of the SSH session. One of:                                                            |                                                 |
|           | connecting                                                                                               | The device is looking for a remote server.      |
|           | connected                                                                                                | The device is connected to the remote server.   |
|           | accepted                                                                                                 | The device has accepted a new session.          |
|           | host-auth                                                                                                | host-to-host authentication is in progress.     |
|           | user-auth                                                                                                | User authentication is in progress.             |
|           | authenticated                                                                                            | User authentication is complete.                |
|           | open                                                                                                     | The session is in progress.                     |
|           | download                                                                                                 | The user is downloading a file from the device. |
|           | upload                                                                                                   | The user is uploading a file from the device.   |
|           | closing                                                                                                  | The user is terminating the session.            |
|           | closed                                                                                                   | The session is closed.                          |

| Parameter | Description                                                           |
|-----------|-----------------------------------------------------------------------|
| Filename  | Local filename of the file that the user is downloading or uploading. |

**Related** [clear ssh](#)  
**commands**



# show ssh client

**Overview** This command displays the current configuration of the Secure Shell client.

**Syntax** show ssh client

**Mode** User Exec, Privileged Exec and Global Configuration

**Example** To display the current configuration for SSH clients on the login shell, use the command:

```
awplus# show ssh client
```

**Output** The following shows typical output.

## Example output from the show ssh client command

```
Secure Shell Client Configuration

Port : 22
Version : 2,1
Connect Timeout : 30 seconds
Session Timeout : 0 (off)
Debug : NONE
```

## Parameters in the output of the show ssh client command

| Parameter       | Description                                                                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Port            | SSH server TCP port where the SSH client connects to. The default is port 22.                                                                               |
| Version         | SSH server version, either "2" or "2,1". From AlliedWare Plus 5.5.1-1.1 onwards, SSH version 1 is not supported.                                            |
| Connect Timeout | Time in seconds that the SSH client waits for an SSH session to establish. If the value is 0, the connection is terminated when it reaches the TCP timeout. |
| Debug           | Whether debugging is active on the client.                                                                                                                  |

**Related commands** [show ssh server](#)

**Command changes** Version 5.5.3-1.1: added to AR1050V

# show ssh server

**Overview** This command displays the current configuration of the Secure Shell server.

Note that changes to the SSH configuration affects only new SSH sessions coming from remote hosts, and does not affect existing sessions.

**Syntax** show ssh server

**Mode** User Exec, Privileged Exec, and Global Configuration

**Example** To display the current configuration of the Secure Shell server, use the command:

```
awplus# show ssh server
```

**Output** The following shows typical output.

**Example output from the show ssh server command**

```
Secure Shell Server Configuration

SSH Server : Enabled
Protocol : IPv4,IPv6
Port : 22
Version : 2
Services : scp, sftp
User Authentication : publickey, password
Resolve Hosts : Disabled
Session Timeout : 0 (Off)
Login Timeout : 60 seconds
Maximum Authentication Tries : 6
Maximum Startups : 10
Debug : NONE
Ciphers : aes128-cbc,aes128-ctr,aes192-ctr,aes256-ctr
KEX : curve25519-sha256@libssh.org,
 ecdh-sha2-nistp256,ecdh-sha2-nistp384,
 ecdh-sha2-nistp521,
 diffie-hellman-group-exchange-sha256,
 diffie-hellman-group-exchange-sha1,
 diffie-hellman-group14-sha1
```

**Parameters in the output of the show ssh server command**

| Parameter           | Description                                                                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SSH Server          | Whether the Secure Shell server is enabled or disabled.                                                                                                                              |
| Port                | TCP port where the Secure Shell server listens for connections. The default is port 22.                                                                                              |
| Version             | SSH server version; either '2' or '2.1'. From AlliedWare Plus 5.5.1-1.1 onwards, SSH version 1 is not supported.                                                                     |
| Services            | List of the available Secure Shell services; one or more of SHELL, SCP or SFTP.                                                                                                      |
| User Authentication | List of available authentication methods.                                                                                                                                            |
| Login Timeout       | Time (in seconds) that the SSH server will wait the SSH session to establish. If the value is 0, the client login will be terminated when TCP timeout reaches.                       |
| Idle Timeout        | Time (in seconds) that the SSH server will wait to receive data from the SSH client. The server disconnects if this timer limit is reached. If set at 0, the idle timer remains off. |
| Maximum Startups    | The maximum number of concurrent connections that are waiting authentication. The default is 10.                                                                                     |
| Debug               | Whether debugging is active on the server.                                                                                                                                           |

| Parameter | Description                                |
|-----------|--------------------------------------------|
| Ciphers   | List of ciphers permitted.                 |
| KEX       | List of available Key Exchange algorithms. |

**Related** [show ssh](#)  
**commands** [show ssh client](#)

# show ssh server allow-users

**Overview** This command displays the user entries in the allow list of the SSH server.

**Syntax** show ssh server allow-users

**Mode** User Exec, Privileged Exec and Global Configuration

**Example** To display the user entries in the allow list of the SSH server, use the command:

```
awplus# show ssh server allow-users
```

**Output** The following shows typical output.

## Example output from the show ssh server allow-users command

| Username | Remote Hostname (pattern) |
|----------|---------------------------|
| -----    | -----                     |
| awplus   | 192.168.*                 |
| john     |                           |
| manager  | *.alliedtelesis.com       |

## Parameters in the output of the show ssh server allow-users command

| Parameter                 | Description                                                                                                                                                                               |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Username                  | User name that is allowed to access the SSH server.                                                                                                                                       |
| Remote Hostname (pattern) | IP address or hostname pattern of the remote client. The user is allowed requests from a host that matches this pattern. If no hostname is specified, the user is allowed from all hosts. |

**Related commands** [ssh server allow-users](#)  
[ssh server deny-users](#)

# show ssh server deny-users

**Overview** This command displays the user entries in the deny list of the SSH server. The user in the deny list is rejected to access the SSH server. If a user is not included in the access list of the SSH server, the user is also rejected.

**Syntax** show ssh server deny-users

**Mode** User Exec, Privileged Exec and Global Configuration

**Example** To display the user entries in the deny list of the SSH server, use the command:

```
awplus# show ssh server deny-users
```

**Output** The following shows typical output.

## Example output from the show ssh server deny-users command

| Username | Remote Hostname (pattern) |
|----------|---------------------------|
| -----    | -----                     |
| john     | *.b-company.com           |
| manager  | 192.168.2.*               |

## Parameters in the output of the show ssh server deny-user command

| Parameter                 | Description                                                                                                                                                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Username                  | The user that this rule applies to.                                                                                                                                                     |
| Remote Hostname (pattern) | IP address or hostname pattern of the remote client. The user is denied requests from a host that matches this pattern. If no hostname is specified, the user is denied from all hosts. |

**Related commands** [ssh server allow-users](#)  
[ssh server deny-users](#)

## ssh

**Overview** Use this command to initiate a Secure Shell connection to a remote SSH server.

If the server requests a password to login, you need to type in the correct password at the "Password:" prompt.

An SSH client identifies the remote SSH server by its public key registered on the client device. If the server identification is changed, server verification fails. If the public key of the server has been changed, the public key of the server must be explicitly added to the known host database.

**NOTE:** A hostname specified with SSH cannot begin with a hyphen (-) character.

**Syntax** `ssh [ip|ipv6] [user <username>|port <1-65535>|version 2]  
<remote-device> [<command>]`

**Syntax in secure mode** `ssh [cipher {aes128-cbc|aes256-cbc|aes128-ctr|aes192-ctr|aes256-ctr}] [hmac {hmac-sha2-256}]  
[public-key {ecdsa-sha2-nistp256|ecdsa-sha2-nistp384}] [key-exchange {ecdh-sha2-nistp256|ecdh-sha2-nistp384}] [ip|ipv6]  
[user <username>|port <1-65535>|version 2] <remote-device>  
[<command>]`

| Parameter                    | Description                                                                                                                                                                                                                                  |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cipher                       | The supported cipher name.<br>Select either: aes128-cbc or aes256-cbc.                                                                                                                                                                       |
| hmac                         | The supported hmac name: hmac-sha2-256                                                                                                                                                                                                       |
| public-key                   | The supported public-key name.<br>Select either:<br>ecdsa-sha2-nistp256 or ecdsa-sha2-nistp384                                                                                                                                               |
| key-exchange                 | The supported key-exchange name.<br>Select either:<br>ecdsa-sha2-nistp256 or ecdsa-sha2-nistp384                                                                                                                                             |
| ip                           | Specify IPv4 SSH.                                                                                                                                                                                                                            |
| ipv6                         | Specify IPv6 SSH.                                                                                                                                                                                                                            |
| user                         | Login user. If user is specified, the username is used for login to the remote SSH server when user authentication is required. Otherwise the current user name is used.                                                                     |
|                              | <i>&lt;username&gt;</i> User name to login on the remote server.                                                                                                                                                                             |
| port                         | SSH server port. If port is specified, the SSH client connects to the remote SSH server with the specified TCP port. Other- wise, the client port configured by "ssh client" command or the default TCP port (22) is used.                   |
|                              | <i>&lt;1-65535&gt;</i> TCP port.                                                                                                                                                                                                             |
| version                      | SSH client version. From 5.5.1-1.1 onwards, SSH only supports version 2.                                                                                                                                                                     |
| <i>&lt;remote-device&gt;</i> | IPv4/IPv6 address or hostname of a remote server. The address is in the format A.B.C.D for an IPv4 address, or in the format X:X::X:X for an IPv6 address. Note that a hostname specified with SSH cannot begin with a hyphen (-) character. |
| <i>&lt;command&gt;</i>       | A command to execute on the remote server. If a command is specified, the command is executed on the remote SSH server and the session is disconnected when the remote command finishes.                                                     |

## Mode User Exec and Privileged Exec



**Usage notes** This command contains some additional security parameters (cipher, hmac, public-key, and key exchange). To access these parameters you must enable Secure Mode on the device by using the command: **crypto secure-mode**.

```
awplus(config)# crypto secure-mode
```

**Examples** To login to the remote SSH server at 192.0.2.5, use the command:

```
awplus# ssh ip 192.0.2.5
```

To login to the remote SSH server at 192.0.2.5 as user 'manager', use the command:

```
awplus# ssh ip user manager 192.0.2.5
```

To login to the remote SSH server at 192.0.2.5 that is listening on TCP port 2000, use the command:

```
awplus# ssh port 2000 192.0.2.5
```

To login to the remote SSH server 'example\_host' using an IPv6 session, use the command:

```
awplus# ssh ipv6 example_host
```

To run the **cmd** command on the remote SSH server at 192.0.2.5, use the command:

```
awplus# ssh ip 192.0.2.5 cmd
```

**Related commands**

- [crypto key generate userkey](#)
- [crypto secure-mode](#)
- [crypto key pubkey-chain knownhosts](#)
- [debug ssh client](#)
- [ssh client](#)

**Command changes**

- Version 5.5.3-1.1: added to AR1050V
- Version 5.5.1-1.1: support removed for SSH protocol v1
- Version 5.4.8-2.1: secure mode syntax added for x950, SBx908 GEN2.
- Version 5.4.8-1.2: secure mode syntax added for x220, x930, x550, XS900MX.
- Version 5.4.6-2.1: VRF-lite support added for AR-Series devices.

## ssh client

**Overview** This command modifies the default configuration parameters of the Secure Shell (SSH) client. The configuration is used for any SSH client on the device to connect to remote SSH servers. Any parameters specified on SSH client explicitly override the default configuration parameters.

The change affects the current user shell only. When the user exits the login session, the configuration does not persist. This command does not affect existing SSH sessions.

The **no** variant of this command resets configuration parameters of the Secure Shell (SSH) client changed by the **ssh client** command, and restores the defaults.

This command does not affect the existing SSH sessions.

**Syntax** `ssh client {port <1-65535>|version 2|session-timeout <0-3600>|connect-timeout <1-600>}`  
`no ssh client {port|version|session-timeout|connect-timeout}`

| Parameter       | Description                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| port            | <p>The default TCP port of the remote SSH server. If an SSH client specifies an explicit port of the server, it overrides the default TCP port.</p> <p>Default: 22</p> <hr/> <p>&lt;1-65535&gt; TCP port number.</p>                                                                                                                                                                                                       |
| version         | <p>The SSH version used by the client for SSH sessions.</p> <p>From 5.5.1-1.1 onwards, the SSH client supports only version 2</p>                                                                                                                                                                                                                                                                                          |
| session-timeout | <p>The global session timeout for SSH sessions. If the session timer lapses since the last time an SSH client received data from the remote server, the session is terminated. If the value is 0, then the client does not terminate the session. Instead, the connection is terminated when it reaches the TCP timeout.</p> <p>Default: 0 (session timer remains off)</p> <hr/> <p>&lt;0-3600&gt; Timeout in seconds.</p> |
| connect-timeout | <p>The maximum time period that an SSH session can take to become established. The SSH client terminates the SSH session if this timeout expires and the session is still not established.</p> <p>Default: 30</p> <hr/> <p>&lt;1-600&gt; Timeout in seconds.</p>                                                                                                                                                           |

**Mode** Privileged Exec

**Examples** To configure the default TCP port for SSH clients to 2200, and the session timer to 10 minutes, use the command:

```
awplus# ssh client port 2200 session-timeout 600
```

To configure the connect timeout of SSH client to 10 seconds, use the command:

```
awplus# ssh client connect-timeout 10
```

To restore the connect timeout to its default, use the command:

```
awplus# no ssh client connect-timeout
```

**Related commands** [show ssh client](#)  
[ssh](#)

**Command changes** Version 5.5.3-1.1: added to AR1050V  
Version 5.5.2-1.1: **vrf** parameter added for products that support VRF  
Version 5.5.1-1.1: support removed for the ssh-rsa algorithm in OpenSSH and for SSH protocol v1

# ssh client allow-legacy-ssh-rsa

**Overview** Use this command to enable support for the legacy ssh-rsa algorithm on the SSH client. Support for this algorithm was removed in version 5.5.1-1.1 due to security concerns. Support for it is still disabled by default and you should only enable it if you cannot avoid using ssh-rsa. It cannot be enabled when the device is in Secure Mode.

Use the **no** variant of this command to disable support for the legacy ssh-rsa algorithm on the SSH client.

**Syntax** ssh client allow-legacy-ssh-rsa  
no ssh client allow-legacy-ssh-rsa

**Default** Disabled

**Mode** Global Configuration

**Example** To enable SSH client support for the legacy ssh-rsa algorithm, use the commands:

```
awplus# configure terminal
awplus(config)# ssh client allow-legacy-ssh-rsa
```

**Related commands** [show ssh client](#)  
[ssh client](#)  
[ssh server allow-legacy-ssh-rsa](#)

**Command changes** Version 5.5.3-1.1: added to AR1050V  
Version 5.5.3-0.1: command added

## ssh server

**Overview** Use this command to modify the configuration of the SSH server. Changing these parameters affects new SSH sessions connecting to the device.

Use the **no** variant of this command to restore the configuration of a specified parameter to its default. The change affects the SSH server immediately if the server is running. Otherwise, the configuration is used when the server starts.

To enable the SSH server, use the **service ssh** command.

**Syntax** `ssh server <1-65535>`  
`ssh server {[session-timeout <0-3600>] [login-timeout <1-600>]  
[max-startups <1-128>]}`  
`no ssh server {[session-timeout] [login-timeout] [max-startups]}`

| Parameter       | Description                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <1-65535>       | The TCP port number that the server listens to for incoming SSH sessions.<br><br>Default: 22                                                                                                                                                                                                                                                                               |
| session-timeout | The maximum time period that the server waits before deciding that a session is inactive and should be terminated. The server considers the session inactive when it has not received any data from the client, and when the client does not respond to keep alive messages.<br><br>Default: 0 (session timer remains off).<br><br>Enter a timeout between 0-3600 seconds. |
| login-timeout   | The maximum time period the server waits before disconnecting an unauthenticated client.<br><br>Default: 60<br><br>Enter a timeout between 1- 600 seconds.                                                                                                                                                                                                                 |
| max-startups    | The maximum number of concurrent unauthenticated connections the server accepts. When the number of SSH connections awaiting authentication reaches the limit, the server drops any additional connections until authentication succeeds or the login timer expires for a connection.<br><br>Default: 10<br><br>Enter a number of sessions in the range of 1-128.          |

**Mode** Global Configuration

**Examples** To set the session timer of the SSH server to 10 minutes (600 seconds), use the commands:

```
awplus# configure terminal
awplus(config)# ssh server session-timeout 600
```

To set the login timeout of the SSH server to 30 seconds, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server login-timeout 30
```

To limit the number of SSH client connections waiting for authentication from the SSH server to 3, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server max-startups 3
```

To return the limit on the number of waiting connections to the default of 10, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server max-startups
```

To support the SSH server with TCP port 2200, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server 2200
```

**Related commands** [show ssh server](#)  
[ssh client](#)

**Command changes** Version 5.5.1-1.1: support removed for the ssh-rsa algorithm in OpenSSH and for SSH protocol v1

# ssh server allow-legacy-ssh-rsa

**Overview** Use this command to enable support for the legacy ssh-rsa algorithm on the SSH server. Support for this algorithm was removed in version 5.5.1-1.1 due to security concerns. Support for it is still disabled by default and you should only enable it if you cannot avoid using ssh-rsa. It cannot be enabled when the device is in Secure Mode.

Use the **no** variant of this command to disable support for the legacy ssh-rsa algorithm on the SSH server.

**Syntax** ssh server allow-legacy-ssh-rsa  
no ssh server allow-legacy-ssh-rsa

**Default** Disabled

**Mode** Global Configuration

**Example** To enable SSH server support for the legacy ssh-rsa algorithm, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server allow-legacy-ssh-rsa
```

**Related commands** [show ssh server](#)  
[ssh server](#)  
[ssh client allow-legacy-ssh-rsa](#)

**Command changes** Version 5.5.3-0.1: command added



## ssh server allow-users

**Overview** This command adds a username pattern to the allow list of the SSH server. If the user of an incoming SSH session matches the pattern, the session is accepted.

When there are no registered users in the server's database of allowed users, the SSH server does not accept SSH sessions even when enabled.

SSH server also maintains the deny list. The server checks the user in the deny list first. If a user is listed in the deny list, then the user access is denied even if the user is listed in the allow list.

The **no** variant of this command deletes a username pattern from the allow list of the SSH server. To delete an entry from the allow list, the username and hostname pattern should match exactly with the existing entry.

**Syntax** `ssh server allow-users <username-pattern> [<hostname-pattern>]`  
`no ssh server allow-users <username-pattern> [<hostname-pattern>]`

| Parameter                             | Description                                                                                                                                                                                                              |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;username-pattern&gt;</code> | The username pattern that users can match to. An asterisk acts as a wildcard character that matches any string of characters.                                                                                            |
| <code>&lt;hostname-pattern&gt;</code> | The host name pattern that hosts can match to. If specified, the server allows the user to connect only from hosts matching the pattern. An asterisk acts as a wildcard character that matches any string of characters. |

**Mode** Global Configuration

**Examples** To allow the user john to create an SSH session from any host, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server allow-users john
```

To allow the user john to create an SSH session from a range of IP address (from 192.168.1.1 to 192.168.1.255), use the commands:

```
awplus# configure terminal
awplus(config)# ssh server allow-users john 192.168.1.*
```

To allow the user john to create a SSH session from a-company.com domain, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server allow-users john *.a-company.com
```

To delete the existing user entry john 192.168.1.\* in the allow list, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server allow-users john 192.168.1.*
```

**Related commands**

- show running-config ssh**
- show ssh server allow-users**
- ssh server deny-users**

# ssh server authentication

**Overview** This command enables RSA public-key or password user authentication for SSH Server. Apply the **password** keyword with the **ssh server authentication** command to enable password authentication for users. Apply the **publickey** keyword with the **ssh server authentication** command to enable RSA public-key authentication for users.

Use the **no** variant of this command to disable RSA public-key or password user authentication for SSH Server. Apply the **password** keyword with the **no ssh authentication** command to disable password authentication for users. Apply the required **publickey** keyword with the **no ssh authentication** command to disable RSA public-key authentication for users.

**Syntax** ssh server authentication {password|publickey}  
no ssh server authentication {password|publickey}

| Parameter | Description                                             |
|-----------|---------------------------------------------------------|
| password  | Specifies user password authentication for SSH server.  |
| publickey | Specifies user publickey authentication for SSH server. |

**Default** Both RSA public-key authentication and password authentication are enabled by default.

**Mode** Global Configuration

**Usage** For password authentication to authenticate a user, password authentication for a user must be registered in the local user database or on an external RADIUS server, before using the **ssh server authentication password** command.

For RSA public-key authentication to authenticate a user, a public key must be added for the user, before using the **ssh server authentication publickey** command.

**Examples** To enable password authentication for users connecting through SSH, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server authentication password
```

To enable publickey authentication for users connecting through SSH, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server authentication publickey
```

To disable password authentication for users connecting through SSH, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server authentication password
```

To disable publickey authentication for users connecting through SSH, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server authentication publickey
```

**Related commands** [crypto key pubkey-chain userkey](#)  
[service ssh](#)  
[show ssh server](#)

## ssh server deny-users

**Overview** This command adds a username pattern to the deny list of the SSH server. If the user of an incoming SSH session matches the pattern, the session is rejected.

SSH server also maintains the allow list. The server checks the user in the deny list first. If a user is listed in the deny list, then the user access is denied even if the user is listed in the allow list.

If a hostname pattern is specified, the user is denied from the hosts matching the pattern.

The **no** variant of this command deletes a username pattern from the deny list of the SSH server. To delete an entry from the deny list, the username and hostname pattern should match exactly with the existing entry.

**Syntax** `ssh server deny-users <username-pattern> [<hostname-pattern>]`  
`no ssh server deny-users <username-pattern> [<hostname-pattern>]`

| Parameter                             | Description                                                                                                                                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;username-pattern&gt;</code> | The username pattern that users can match to. The username must begin with a letter. Valid characters are all numbers, letters, and the underscore, hyphen, full stop and asterisk symbols. An asterisk acts as a wildcard character that matches any string of characters. |
| <code>&lt;hostname-pattern&gt;</code> | The host name pattern that hosts can match to. If specified, the server denies the user only when they connect from hosts matching the pattern. An asterisk acts as a wildcard character that matches any string of characters.                                             |

**Mode** Global Configuration

**Examples** To deny the user john to access SSH login from any host, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server deny-users john
```

To deny the user john to access SSH login from a range of IP address (from 192.168.2.1 to 192.168.2.255), use the commands:

```
awplus# configure terminal
awplus(config)# ssh server deny-users john 192.168.2.*
```

To deny the user john to access SSH login from b-company.com domain, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server deny-users john*.b-company.com
```

To delete the existing user entry john 192.168.2.\* in the deny list, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server deny-users john 192.168.2.*
```

**Related commands** [show running-config ssh](#)  
[show ssh server deny-users](#)  
[ssh server allow-users](#)

# ssh server disallow-cbc-ciphers

**Overview** Use this command to disallow CBC mode ciphers on SSH servers. You can only use this command when your device is in Secure Mode (see the [crypto secure-mode](#) command).

Use the **no** variant of this command to allow CBC mode ciphers.

**Syntax** `ssh server disallow-cbc-ciphers`  
`no ssh server disallow-cbc-ciphers`

**Default** CBC mode ciphers are allowed by default.

**Mode** Global Configuration

**Example** To disallow CBC mode ciphers for SSH server in Secure Mode, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server disallow-cbc-ciphers
```

**Related commands** [crypto secure-mode](#)  
[service ssh](#)  
[ssh server](#)

**Command changes** Version 5.5.1-2.1: command added

# ssh server max-auth-tries

**Overview** Use this command to specify the maximum number of SSH authentication attempts that the device will allow.

Use the **no** variant of this command to return the maximum number of attempts to its default value of 6.

**Syntax** `ssh server max-auth-tries <1-32>`  
`no ssh server max-auth-tries`

| Parameter | Description                                                          |
|-----------|----------------------------------------------------------------------|
|           | Maximum number of SSH authentication attempts the device will allow. |

**Default** 6 attempts

**Mode** Global Configuration

**Usage** By default, users must wait one second after a failed login attempt before trying again. You can increase this gap by using the command [aaa login fail-delay](#).

**Example** To set the maximum number of SSH authentication attempts to 3, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server max-auth-tries 3
```

**Related commands** [show ssh server](#)



# ssh server resolve-host

**Overview** This command enables resolving an IP address from a host name using a DNS server for client host authentication.

The **no** variant of this command disables this feature.

**Syntax** `ssh server resolve-hosts`  
`no ssh server resolve-hosts`

**Default** This feature is disabled by default.

**Mode** Global Configuration

**Usage notes** Your device has a DNS Client that is enabled automatically when you add a DNS server to your device. Use the **ip name-server** command to add a DNS server to the list of servers that the device queries.

**Example** To resolve a host name using a DNS server, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server resolve-hosts
```

**Related commands** **ip name-server**  
**show ssh server**  
**ssh server allow-users**  
**ssh server deny-users**

## ssh server scp

**Overview** This command enables the Secure Copy (SCP) service on the SSH server. Once enabled, the server accepts SCP requests from remote clients.

You must enable the SSH server as well as this service before the device accepts SCP connections. The SCP service is enabled by default as soon as the SSH server is enabled.

The **no** variant of this command disables the SCP service on the SSH server. Once disabled, SCP requests from remote clients are rejected.

**Syntax** ssh server scp  
no ssh server scp

**Mode** Global Configuration

**Examples** To enable the SCP service, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server scp
```

To disable the SCP service, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server scp
```

**Related commands** [show running-config ssh](#)  
[show ssh server](#)

## ssh server secure-algs

**Overview** Use this command to force the SSH server to only use ciphers, key exchange algorithms and Message Authentication Code (MAC) algorithms that are currently considered best-practice.

This command is the same as using all of the commands **ssh server secure-ciphers**, **ssh server secure-hostkey**, **ssh server secure-mac**, and **ssh server secure-kex**. However, it does not include the optional **exclude-nist-curves** parameter of **ssh server secure-kex**.

Use the **no** variant of this command to stop forcing the SSH server to use this restricted set of algorithms.

**Syntax** `ssh server secure-algs`  
`no ssh server secure-algs`

**Default** Disabled.

**Mode** Global Configuration

**Usage notes** To see the list of algorithms, use the **show ssh server** command.

This command is not available in Secure Mode because Secure Mode already forces the device to use only FIPS-approved algorithms.

**Example** To force the SSH server to use best-practice algorithms, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server secure-algs
```

**Related commands** **show ssh server**  
**ssh server**  
**ssh server secure-ciphers**  
**ssh server secure-hostkey**  
**ssh server secure-kex**  
**ssh server secure-mac**

**Command changes** Version 5.5.1-1.1: command added

# ssh server secure-ciphers

**Overview** Use this command to force the SSH server to only negotiate ciphers regarded as current best-practice.

Use the **no** variant of this command to stop forcing the SSH server to use this restricted set of ciphers.

**Syntax** `ssh server secure-ciphers`  
`no ssh server secure-ciphers`

**Default** Not set

**Mode** Global Configuration

**Usage notes** To see the list of ciphers, use the [show ssh server](#) command.  
This command is not available in Secure Mode because Secure Mode already forces the device to use only FIPS-approved algorithms.

**Example** To configure the SSH server to use best-practice ciphers, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server secure-ciphers
```

**Related commands** [show ssh server](#)  
[ssh server](#)  
[ssh server secure-algs](#)  
[ssh server secure-hostkey](#)  
[ssh server secure-kex](#)  
[ssh server secure-mac](#)

**Command changes** Version 5.5.0-1.1: command added

# ssh server secure-hostkey

**Overview** Use this command to force the SSH server to only use hostkey algorithms that are currently considered best-practice. This excludes NIST curve-based hostkey algorithms.

Use the **no** variant of this command to stop forcing the SSH server to use this restricted set of hostkey algorithms.

**Syntax** `ssh server secure-hostkey`  
`no ssh server secure-hostkey`

**Default** Disabled

**Mode** Global Configuration

**Usage notes** Using this command may reduce compatibility with older SSH clients.  
To see the list of hostkey algorithms, use the **show ssh server** command.  
This command is not available in Secure Mode because Secure Mode already forces the device to use only FIPS-approved algorithms.

**Example** To force the SSH server to use best-practice hostkey algorithms, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server secure-hostkey
```

**Related commands** **show ssh server**  
**ssh server**  
**ssh server secure-algs**  
**ssh server secure-ciphers**  
**ssh server secure-kex**  
**ssh server secure-mac**

**Command changes** Version 5.5.2-2.1: command added

## ssh server secure-kex

**Overview** Use this command to force the SSH server to only use key exchange algorithms that are currently considered best-practice.

For example, using this command stops the device from using the diffie-hellman-group-exchange-sha1 key exchange algorithm.

Use the **no** variant of this command to stop forcing the SSH server to use this restricted set of key-exchange algorithms.

**Syntax** `ssh server secure-kex [exclude-nist-curves]`  
`no ssh server secure-kex`

| Parameter                        | Description                                                                                                                 |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <code>exclude-nist-curves</code> | Also exclude all NIST key exchange algorithms.<br><br>Using this parameter may reduce compatibility with older SSH clients. |

**Default** Disabled.

**Mode** Global Configuration

**Usage notes** To see the list of key exchange algorithms, use the [show ssh server](#) command.

This command is not available in Secure Mode because Secure Mode already forces the device to use only FIPS-approved algorithms.

**Example** To force the SSH server to use best-practice key-exchange algorithms, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server secure-kex
```

**Related commands** [show ssh server](#)  
[ssh server](#)  
[ssh server secure-algs](#)  
[ssh server secure-ciphers](#)  
[ssh server secure-hostkey](#)  
[ssh server secure-mac](#)

**Command changes** Version 5.5.2-2.1: **exclude-nist-curves** parameter added  
Version 5.5.0-2.3: command added

## ssh server secure-mac

**Overview** Use this command to force the SSH server to only use Message Authentication Code (MAC) algorithms that are currently considered best-practice.

Use the **no** variant of this command to stop forcing the SSH server to use this restricted set of MAC algorithms.

**Syntax** `ssh server secure-mac`  
`no ssh server secure-mac`

**Default** Disabled.

**Mode** Global Configuration

**Usage notes** To see the list of MAC algorithms, use the **show ssh server** command. This command is not available in Secure Mode because Secure Mode already forces the device to use only FIPS-approved algorithms.

**Example** To force the SSH server to use best-practice MAC algorithms, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server secure-mac
```

**Related commands** **show ssh server**  
**ssh server**  
**ssh server secure-algs**  
**ssh server secure-ciphers**  
**ssh server secure-hostkey**  
**ssh server secure-kex**

**Command changes** Version 5.5.1-1.1: command added



## ssh server sftp

**Overview** This command enables the Secure FTP (SFTP) service on the SSH server. Once enabled, the server accepts SFTP requests from remote clients.

You must enable the SSH server as well as this service before the device accepts SFTP connections. The SFTP service is enabled by default as soon as the SSH server is enabled. If the SSH server is disabled, SFTP service is unavailable.

The **no** variant of this command disables SFTP service on the SSH server. Once disabled, SFTP requests from remote clients are rejected.

**Syntax** ssh server sftp  
no ssh server sftp

**Mode** Global Configuration

**Examples** To enable the SFTP service, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server sftp
```

To disable the SFTP service, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server sftp
```

**Related commands** [show running-config ssh](#)  
[show ssh server](#)

# ssh server tcpforwarding

**Overview** Use this command to enable TCP port forwarding on the SSH server. It is disabled by default, to enhance security.  
Use the **no** variant of this command to disable TCP port forwarding again.

**Syntax** ssh server tcpforwarding  
no ssh server tcpforwarding

**Default** Disabled

**Mode** Global Configuration

**Example** To enable TCP port forwarding, use the commands:

```
awplus# configure terminal
awplus(config)# ssh server tcpforwarding
```

To disable it again, use the commands:

```
awplus# configure terminal
awplus(config)# no ssh server tcpforwarding
```

**Related commands** [show ssh server](#)

**Command changes** Version 5.5.2-1.1: command added

# undebug ssh client

**Overview** This command applies the functionality of the **no debug ssh client** command.

**Command changes** Version 5.5.3-1.1: added to AR1050V

# undebug ssh server

**Overview** This command applies the functionality of the **no debug ssh server** command.

# 65

## Trigger Commands

- Contents**
- **Introduction** on page 3474
  - **active (trigger)** on page 3475
  - **day** on page 3476
  - **debug trigger** on page 3478
  - **description (trigger)** on page 3479
  - **repeat** on page 3480
  - **script** on page 3482
  - **show debugging trigger** on page 3484
  - **show running-config trigger** on page 3485
  - **show trigger** on page 3486
  - **test** on page 3491
  - **time (trigger)** on page 3492
  - **trap** on page 3494
  - **trigger** on page 3495
  - **trigger activate** on page 3496
  - **type atmf guest** on page 3497
  - **type atmf node** on page 3498
  - **type cpu** on page 3501
  - **type env-sensor** on page 3503
  - **type interface** on page 3506
  - **type linkmon-probe** on page 3507
  - **type log** on page 3509
  - **type main-pse** on page 3510
  - **type memory** on page 3511
  - **type periodic** on page 3512
  - **type ping-poll** on page 3513
  - **type pse-port** on page 3514
  - **type reboot** on page 3515
  - **type time** on page 3516
  - **type usb** on page 3517
  - **undebg trigger** on page 3518

# Introduction

**Overview** This chapter provides an alphabetical reference for commands used to configure Triggers. For more information, see the [Triggers Feature Overview and Configuration Guide](#).

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

# active (trigger)

**Overview** This command enables a trigger. This allows the trigger to activate when its trigger conditions are met.

The **no** variant of this command disables a trigger. While in this state the trigger cannot activate when its trigger conditions are met.

**Syntax** active  
no active

**Default** Active, which means that triggers are enabled by default

**Mode** Trigger Configuration

**Usage notes** Configure a trigger first before you use this command to activate it.  
For information about configuring a trigger, see the [Triggers\\_Feature Overview and Configuration Guide](#).

**Examples** To enable trigger 172, so that it can activate when its trigger conditions are met, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 172
awplus(config-trigger)# active
```

To disable trigger 182, preventing it from activating when its trigger conditions are met, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 182
awplus(config-trigger)# no active
```

**Related commands** [show trigger](#)  
[trigger](#)  
[trigger activate](#)

# day

**Overview** This command specifies the days or date that the trigger can activate on. You can specify one of:

- A specific date
- A specific day of the week
- A list of days of the week
- A day of any month of any year
- A day of a specific month in any year
- Every day

By default, the trigger can activate on any day.

**Syntax** day every-day  
day <1-31>  
day <1-31> <month>  
day <1-31> <month> <year>  
day <weekday>

| Parameter | Description                                                                                                                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| every-day | Sets the trigger so that it can activate on any day.                                                                                                                                                                                                                                   |
| <1-31>    | Day of the month the trigger is permitted to activate on.                                                                                                                                                                                                                              |
| <month>   | Sets the month that the trigger is permitted to activate on. Valid keywords are: <b>january</b> , <b>february</b> , <b>march</b> , <b>april</b> , <b>may</b> , <b>june</b> , <b>july</b> , <b>august</b> , <b>september</b> , <b>october</b> , <b>november</b> , and <b>december</b> . |
| <year>    | Sets the year that the trigger is permitted to activate in, between 2000 and 2035.                                                                                                                                                                                                     |
| <weekday> | Sets the days of the week that the trigger can activate on. You can specify one or more week days in a space separated list. Valid keywords are: <b>monday</b> , <b>tuesday</b> , <b>wednesday</b> , <b>thursday</b> , <b>friday</b> , <b>saturday</b> , and <b>sunday</b> .           |

**Default** **every-day**, so by default, the trigger can activate on any day.

**Mode** Trigger Configuration

**Usage notes** For example trigger configurations that use the **day** command, see “Restrict Internet Access” and “Turn off Power to Port LEDs” in the [Triggers Feature Overview and Configuration Guide](#).



**Examples** To permit trigger 55 to activate on the 1 June 2019, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 55
awplus(config-trigger)# day 1 jun 2019
```

To permit trigger 12 to activate on Mondays, Wednesdays and Fridays, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 12
awplus(config-trigger)# day monday wednesday friday
```

To permit trigger 17 to activate on the 5th day of any month, in any year, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 17
awplus(config-trigger)# day 5
```

To permit trigger 6 to activate on the 20th day of September, in any year, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 6
awplus(config-trigger)# day 20 september
```

To permit trigger 14 to activate on the 1st day of each month, in any year, at 11.00am, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 14
awplus(config-trigger)# day 1
awplus(config-trigger)# type time 11:00
```

**Related commands** [show trigger](#)  
[type time](#)  
[trigger](#)

**Command changes** Version 5.4.8-2.1: day of the month functionality added

# debug trigger

**Overview** This command enables trigger debugging. This generates detailed messages about how your device is processing the trigger commands and activating the triggers.

The **no** variant of this command disables trigger debugging.

**Syntax** debug trigger  
no debug trigger

**Mode** Privileged Exec

**Examples** To start trigger debugging, use the command:

```
awplus# debug trigger
```

To stop trigger debugging, use the command:

```
awplus# no trigger
```

**Related commands** [show debugging trigger](#)  
[show trigger](#)  
[test](#)  
[trigger](#)  
[undebug trigger](#)

# description (trigger)

**Overview** This command adds an optional description to help you identify the trigger. This description is displayed in show command outputs and log messages.

The **no** variant of this command removes a trigger's description. The show command outputs and log messages stop displaying a description for this trigger.

**Syntax** `description <description>`  
`no description`

| Parameter                        | Description                                                                                                                                                       |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;description&gt;</code> | A word or phrase that uniquely identifies this trigger or its purpose. Valid characters are any printable character and spaces, up to a maximum of 40 characters. |

**Mode** Trigger Configuration

**Examples** To give trigger 240 the description `daily status report`, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 240
awplus(config-trigger)# description daily status report
```

To remove the description from trigger 36, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 36
awplus(config-trigger)# no description
```

**Related commands** [show trigger](#)  
[test](#)  
[trigger](#)

# repeat

**Overview** This command specifies the number of times that a trigger is permitted to activate. This allows you to specify whether you want the trigger to activate:

- only the first time that the trigger conditions are met
- a limited number of times that the trigger conditions are met
- an unlimited number of times

Once the trigger has reached the limit set with this command, the trigger remains in your configuration but cannot be activated. Use the **repeat** command again to reset the trigger so that it is activated when its trigger conditions are met.

By default, triggers can activate an unlimited number of times. To reset a trigger to this default, specify either **yes** or **forever**.

**Syntax** repeat {forever|no|once|yes|<1-4294967294>}

| Parameter      | Description                                          |
|----------------|------------------------------------------------------|
| yes \| forever  | The trigger repeats indefinitely, or until disabled. |
| no \| once      | The trigger activates only once.                     |
| <1-4292967294> | The trigger repeats the specified number of times.   |

**Mode** Trigger Configuration

**Examples** To allow trigger 21 to activate only once, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 21
awplus(config-trigger)# repeat no
```

To allow trigger 22 to activate an unlimited number of times whenever its trigger conditions are met, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 22
awplus(config-trigger)# repeat forever
```

To allow trigger 23 to activate only the first 10 times the conditions are met, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 23
awplus(config-trigger)# repeat 10
```

**Related** [show trigger](#)  
**commands** [trigger](#)

# script

**Overview** This command specifies one or more scripts that are to be run when the trigger activates. You can add up to five scripts to a single trigger.

The sequence in which the trigger runs the scripts is specified by the number you set before the name of the script file. One script is executed completely before the next script begins.

Scripts may be either ASH shell scripts, indicated by a **.sh** filename extension suffix, or AlliedWare Plus scripts, indicated by a **.scp** filename extension suffix. AlliedWare Plus scripts only need to be readable. You can't use ASH scripts when the device is in Secure Mode.

The **no** variant of this command removes one or more scripts from the trigger's script list. The scripts are identified by either their name, or by specifying their position in the script list. The **all** parameter removes all scripts from the trigger.

**Syntax** `script <1-5> {<filename>}`  
`no script {<1-5>|<filename>|all}`

| Parameter  | Description                                                                                          |
|------------|------------------------------------------------------------------------------------------------------|
| <1-5>      | The position of the script in execution sequence. The trigger runs the lowest numbered script first. |
| <filename> | The path to the script file.                                                                         |

**Mode** Trigger Configuration

**Examples** To configure trigger 71 to run the script flash:/cpu\_trig.sh in position 3 when the trigger activates, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 71
awplus(config-trigger)# script 3 flash:/cpu_trig.sh
```

To configure trigger 99 to run the scripts flash:reconfig.scp, flash:cpu\_trig.sh and flash:email.scp in positions 2, 3 and 5 when the trigger activates, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 99
awplus(config-trigger)# script 2 flash:/reconfig.scp 3 flash:/
cpu_trig.sh 5 flash:/email.scp
```

To remove the scripts 1, 3 and 4 from trigger 71's script list, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 71
awplus(config-trigger)# no script 1 3 4
```

To remove the script flash:/cpu\_trig.sh from trigger 71's script list, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 71
awplus(config-trigger)# no script flash:/cpu_trig.sh
```

To remove all the scripts from trigger 71's script list, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 71
awplus(config-trigger)# no script all
```

**Related commands** [show trigger](#)  
[trigger](#)

# show debugging trigger

**Overview** This command displays the current status for trigger utility debugging. Use this command to show when trigger debugging has been turned on or off from the **debug trigger** command.

**Syntax** show debugging trigger

**Mode** User Exec and Privileged Exec

**Example** To display the current configuration of trigger debugging, use the command:

```
awplus# show debugging trigger
```

**Output** The following shows typical output.

## Example output from the show debugging trigger command

```
awplus#debug trigger
awplus#show debugging trigger
Trigger debugging status:
 Trigger debugging is on

awplus#no debug trigger
awplus#show debugging trigger
Trigger debugging status:
 Trigger debugging is off
```

**Related commands** **debug trigger**



# show running-config trigger

**Overview** This command displays the current running configuration of the trigger utility.

**Syntax** show running-config trigger

**Mode** Privileged Exec

**Example** To display the current configuration of the trigger utility, use the command:

```
awplus# show running-config trigger
```

**Output** The following shows typical output.

## Example output from the show running-config trigger command

```
trigger 1
 type card in

type usb in
 trigger 2

type usb out
 !
```

**Related commands** [show trigger](#)

# show trigger

**Overview** This command displays configuration and diagnostic information about the triggers configured on the device. Specify the **show trigger** command without any options to display a summary of the configuration of all triggers.

**Syntax** show trigger [<1-250>|counter|full]

| Parameter | Description                                                                           |
|-----------|---------------------------------------------------------------------------------------|
| <1-250>   | Displays detailed information about a specific trigger, identified by its trigger ID. |
| counter   | Displays statistical information about all triggers.                                  |
| full      | Displays detailed information about all triggers.                                     |

**Mode** Privileged Exec

**Example** To get summary information about all triggers, use the following command:

```
awplus# show trigger
```

### Example output from show trigger

```
awplus#show trigger
```

| TR# | Type & Details    | Name                 | Ac | Te | Repeat     | #Scr | Days/Date |
|-----|-------------------|----------------------|----|----|------------|------|-----------|
| 001 | CPU (80% any)     | Busy CPU             | Y  | N  | 5          | 1    | smtwtfs   |
| 005 | Periodic (30 min) | Regular status check | Y  | N  | Continuous | 1    | -mtwtf-   |
| 007 | Memory (85% up)   | High mem usage       | Y  | N  | 8          | 1    | smtwtfs   |
| 011 | Time (00:01)      | Weekend access       | Y  | N  | Continuous | 1    | -----s    |
| 013 | Reboot            |                      | Y  | N  | Continuous | 2    | smtwtfs   |
| 019 | Ping-poll (5 up)  | Connection to svr1   | Y  | N  | Continuous | 1    | smtwtfs   |

### Parameters in the output of show trigger

| Parameter      | Description                                                                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TR#            | Trigger identifier (ID).                                                                                                                                                                                            |
| Type & Details | The trigger type, followed by the trigger details in brackets.                                                                                                                                                      |
| Name           | Descriptive name of the trigger configured with the <b>description (trigger)</b> command.                                                                                                                           |
| Ac             | Whether the trigger is active (Y), or inactive (N).                                                                                                                                                                 |
| Te             | Whether the trigger is in test mode (Y) or not (N).                                                                                                                                                                 |
| Repeat         | Whether the trigger repeats continuously, and if not, the configured repeat count for the trigger. To see the number of times a trigger has activated, use the <b>show trigger &lt;1-250&gt;</b> command.           |
| #Scr           | Number of scripts associated with the trigger.                                                                                                                                                                      |
| Days/Date      | Days or date when the trigger may be activated. For the days options, the days are shown as a seven character string representing Sunday to Saturday. A hyphen indicates days when the trigger cannot be activated. |

To display detailed information about trigger 3, use the command:

```
awplus# show trigger 3
```

### Example output from show trigger for a specific trigger

```
awplus#show trigger 1
```

| Trigger Configuration Details |                                 |
|-------------------------------|---------------------------------|
| Trigger .....                 | 1                               |
| Name .....                    | display cpu usage when pass 80% |
| Type and details .....        | CPU (80% up)                    |
| Days .....                    | smtwtfs                         |

```
Active Yes
Test No
Trap Yes
Repeat Continuous
Modified Fri Feb 3 17:18:44 2017
Number of activations 0
Last activation not activated
Number of scripts 1
1. shocpu.scp
2.
3.
4.
5.

```

To display detailed information about all triggers, use the command:

```
awplus# show trigger full
```

### Example output from show trigger full

```
awplus#show trigger full
Trigger Configuration Details

Trigger 1
Name Busy CPU
Type and details CPU (80% up)
Days smtwtfss
Active Yes
Test No
Trap Yes
Repeat Continuous
Modified Fri Feb 3 17:05:16 2017
Number of activations 0
Last activation not activated
Number of scripts 2
1. flash:/cpu_alert.sh
2. flash:/reconfig.scp
3.
4.
5.
Trigger 5
Name Regular status check
Type and details Periodic (30 min)
Days smtwtfss
Active Yes
Test No
Trap Yes
Repeat 5 (2)
Modified Fri Feb 3 17:18:44 2017
Number of activations 0
Last activation Fri Feb 10 18:00:00 2017
Number of scripts 1
1. flash:/stat_check.scp
2.
3.
4.
5.

```

### Parameters in the output of show trigger full and show trigger for a specific trigger

| Parameter | Description            |
|-----------|------------------------|
| Trigger   | The ID of the trigger. |

| Parameter             | Description                                                                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                  | Descriptive name of the trigger.                                                                                                                                                                                                              |
| Type and details      | The trigger type and its activation conditions.                                                                                                                                                                                               |
| Days                  | The days on which the trigger is permitted to activate.                                                                                                                                                                                       |
| Date                  | The date on which the trigger is permitted to activate. Only displayed if configured, in which case it replaces "Days".                                                                                                                       |
| Active                | Whether or not the trigger is permitted to activate.                                                                                                                                                                                          |
| Test                  | Whether or not the trigger is operating in diagnostic mode.                                                                                                                                                                                   |
| Trap                  | Whether or not the trigger is enabled to send SNMP traps.                                                                                                                                                                                     |
| Repeat                | Whether the trigger repeats an unlimited number of times (Continuous) or for a set number of times. When the trigger can repeat only a set number of times, then the number of times the trigger has been activated is displayed in brackets. |
| Modified              | The date and time of the last time that the trigger was modified.                                                                                                                                                                             |
| Number of activations | Number of times the trigger has been activated since the last restart of the device.                                                                                                                                                          |
| Last activation       | The date and time of the last time that the trigger was activated.                                                                                                                                                                            |
| Number of scripts     | How many scripts are associated with the trigger, followed by the names of the script files in the order in which they run.                                                                                                                   |

To display counter information about all triggers use the command:

```
awplus# show trigger counter
```

### Example output from show trigger counter

```
awplus# show trigger counter
Trigger Module Counters

Trigger activations 4
Last trigger activated 55
Time triggers activated today 0
Periodic triggers activated today 0
Interface triggers activated today 1
CPU triggers activated today 2
Memory triggers activated today 1
Reboot triggers activated today 0
Ping-poll triggers activated today 0
USB event triggers activated today 0
Stack master fail triggers activated today 0
```

|                                       |   |
|---------------------------------------|---|
| Stack member triggers activated today | 0 |
| Stack link triggers activated today   | 0 |
| ATMF node triggers activated today    | 0 |
| ATMF guest triggers activated today   | 0 |
| Log triggers activated today          | 0 |
| -----                                 |   |

- Related commands

active (trigger)

debug trigger

script

trigger

trigger activate

# test

**Overview** This command puts the trigger into a diagnostic mode. In this mode the trigger may activate but when it does it will not run any of the trigger's scripts. A log message will be generated to indicate when the trigger has been activated.

The **no** variant of this command takes the trigger out of diagnostic mode, restoring normal operation. When the trigger activates, the scripts associated with the trigger will be run, as normal.

**Syntax** test  
no test

**Mode** Trigger Configuration

**Usage notes** Configure a trigger first before you use this command to diagnose it. For information about configuring a trigger, see the [Triggers\\_Feature Overview and Configuration Guide](#).

**Examples** To put trigger 5 into diagnostic mode, where no scripts will be run when the trigger activates, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 5
awplus(config-trigger)# test
```

To take trigger 205 out of diagnostic mode, restoring normal operation, use the commands:

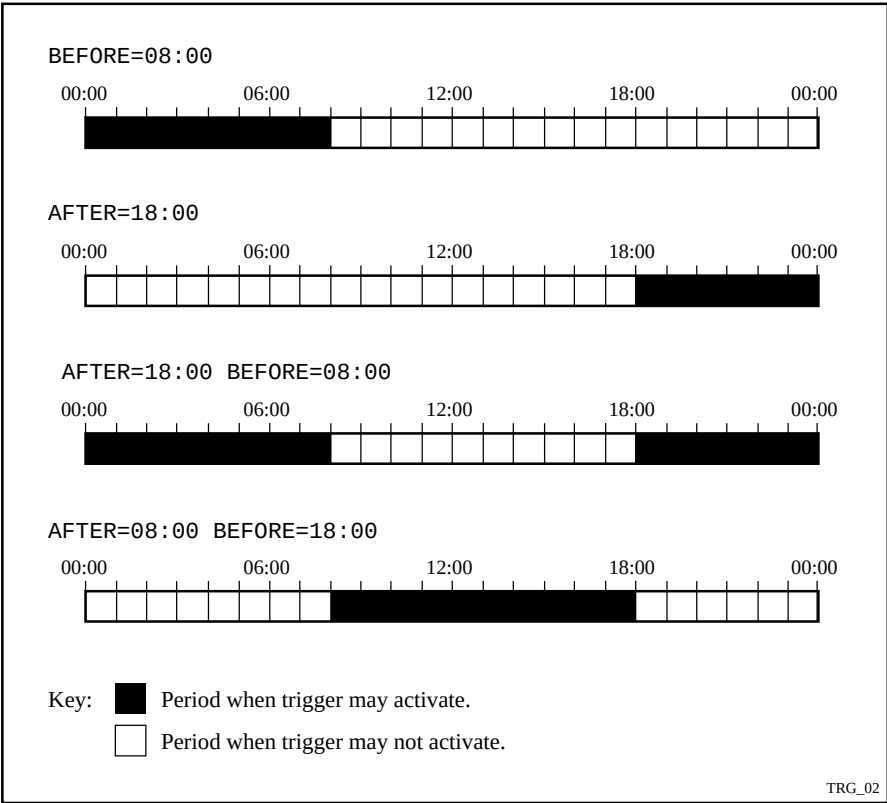
```
awplus# configure terminal
awplus(config)# trigger 205
awplus(config-trigger)# no test
```

**Related commands** [show trigger](#)  
[trigger](#)

# time (trigger)

**Overview** This command specifies the time of day when the trigger is permitted to activate. The **after** parameter specifies the start of a time period that extends to midnight during which trigger may activate. By default the value of this parameter is 00:00:00 (am); that is, the trigger may activate at any time. The **before** parameter specifies the end of a time period beginning at midnight during which the trigger may activate. By default the value of this parameter is 23:59:59; that is, the trigger may activate at any time. If the value specified for **before** is later than the value specified for **after**, a time period from "after" to "before" is defined, during which the trigger may activate. This command is not applicable to time triggers ( **type time** ).

The following figure illustrates how the **before** and **after** parameters operate.



**Syntax** time {[after <hh:mm:ss>] [before <hh:mm:ss>]}

| Parameter        | Description                                                 |
|------------------|-------------------------------------------------------------|
| after<hh:mm:ss>  | The earliest time of day when the trigger may be activated. |
| before<hh:mm:ss> | The latest time of day when the trigger may be activated.   |



**Mode** Trigger Configuration

**Usage notes** For example trigger configurations that use the **time (trigger)** command, see "Restrict Internet Access" and "Turn off Power to Port LEDs" in the [Triggers Feature Overview and Configuration Guide](#).

**Examples** To allow trigger 63 to activate between midnight and 10:30am, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 63
awplus(config-trigger)# time before 10:30:00
```

To allow trigger 64 to activate between 3:45pm and midnight, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 64
awplus(config-trigger)# time after 15:45:00
```

To allow trigger 65 to activate between 10:30am and 8:15pm, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 65
awplus(config-trigger)# time after 10:30:00 before 20:15:00
```

**Related commands** [show trigger](#)  
[trigger](#)

# trap

**Overview** This command enables the specified trigger to send SNMP traps.

Use the **no** variant of this command to disable the sending of SNMP traps from the specified trigger.

**Syntax** trap  
no trap

**Default** SNMP traps are enabled by default for all defined triggers.

**Mode** Trigger Configuration

**Usage notes** You must configure SNMP before using traps with triggers. For more information, see:

- [Support for Allied Telesis Enterprise\\_MIBs\\_in AlliedWare Plus](#), for information about which MIB objects are supported.
- the [SNMP Feature Overview and Configuration\\_Guide](#).
- the [SNMP Commands](#) chapter.

Since SNMP traps are enabled by default for all defined triggers, a common usage will be for the **no** variant of this command to disable SNMP traps from a specified trap if the trap is only periodic. Refer in particular to AT-TRIGGER-MIB in the [Support for Allied Telesis Enterprise\\_MIBs\\_in AlliedWare Plus](#) for further information about the relevant SNMP MIB.

**Examples** To enable SNMP traps to be sent from trigger 5, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 5
awplus(config-trigger)# trap
```

To disable SNMP traps being sent from trigger 205, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 205
awplus(config-trigger)# no trap
```

**Related commands** [trigger](#)  
[show trigger](#)

# trigger

**Overview** This command is used to access the Trigger Configuration mode for the specified trigger. Once Trigger Configuration mode has been entered the trigger type information can be configured and the trigger scripts and other operational parameters can be specified. At a minimum the trigger type information must be specified before the trigger can become active.

The **no** variant of this command removes a specified trigger and all configuration associated with it.

**Syntax** trigger <1-250>  
no trigger <1-250>

| Parameter | Description   |
|-----------|---------------|
| <1-250>   | A trigger ID. |

**Mode** Global Configuration

**Examples** To enter trigger configuration mode for trigger 12, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 12
```

To completely remove all configuration associated with trigger 12, use the commands:

```
awplus# configure terminal
awplus(config)# no trigger 12
```

**Related commands** [show trigger](#)  
[trigger activate](#)

# trigger activate

**Overview** This command is used to manually activate a specified trigger from the Privileged Exec mode, which has been configured with the **trigger** command from the Global Configuration mode.

**Syntax** trigger activate <1-250>

| Parameter | Description   |
|-----------|---------------|
| <1-250>   | A trigger ID. |

**Mode** Privileged Exec

**Usage notes** This command manually activates a trigger without the normal trigger conditions being met.

The trigger is activated even if it has been configured as inactive by using the command **no active**. The scripts associated with the trigger will be executed even if the trigger is in the diagnostic test mode.

Triggers activated manually do not have their repeat counts decremented or their 'last triggered' time updated, and do not result in updates to the '[type] triggers today' counters.

**Example** To manually activate trigger 12 use the command:

```
awplus# trigger activate 12
```

**Related commands** [active \(trigger\)](#)  
[show trigger](#)  
[trigger](#)

# type atmf guest

**Overview** This command configures a trigger to activate when an AMF guest node joins or leaves.

**Syntax** type atmf guest {join|leave}

| Parameter | Description            |
|-----------|------------------------|
| join      | AMF guest node joins.  |
| leave     | AMF guest node leaves. |

**Mode** Trigger Configuration

**Example** To configure trigger 86 to activate when an AMF guest node leaves, use the following commands:

```
awplus(config)# trigger 86
awplus(config-trigger)# type atmf guest leave
```

**Related commands** [show trigger](#)

**Command changes** Version 5.5.1-1.1: command added

## type atmf node

**Overview** This command configures a trigger to activate when an AMF node joins or leaves.

**Syntax** type atmf node {join|leave}

| Parameter | Description      |
|-----------|------------------|
| join      | AMF node joins.  |
| leave     | AMF node leaves. |

**Mode** Trigger Configuration

**Example 1** To configure trigger 5 to activate when an AMF node leaves, use the following commands. In this example the command is entered on node-1:

```
node1(config)# trigger 5
node1(config-trigger)# type atmf node leave
```

**Example 2** The following commands will configure trigger 5 to activate if an AMF node join event occurs on any node within the working set:

```
node1# atmf working-set group all
```

This command returns the following display:

```
=====
node1, node2, node3:
=====

Working set join
```

Note that the running the above command changes the prompt from the name of the local node, to the name of the AMF-Network followed, in square brackets, by the number of member nodes in the working set.

```
AMF-Net[3]# conf t
```

```
AMF-Net[3](config)# trigger 5
```

```
AMF-Net[3](config-trigger)# type atmf node leave
```

```
AMF-Net[3](config-trigger)# description "E-mail on AMF Exit"
```

```
AMF-Net[3](config-trigger)# active
```

Enter the name of the script to run at the trigger event.

```
AMF-Net[3](config-trigger)# script 1 email_me.scp
```

```
AMF-Net[3](config-trigger)# end
```

Display the trigger configurations

```
AMF-Net[3]# show trigger
```

This command returns the following display:

```
=====
node1:
=====

TR# Type & Details Description Ac Te Tr Repeat #Scr Days/Date

001 Periodic (2 min) Periodic Status Chk Y N Y Continuous 1 smtwtfS
005 ATMF node (leave) E-mail on ATMF Exit Y N Y Continuous 1 smtwtfS

=====
Node2, Node3,
=====

TR# Type & Details Description Ac Te Tr Repeat #Scr Days/Date

005 ATMF node (leave) E-mail on ATMF Exit Y N Y Continuous 1 smtwtfS

```

Display the triggers configured on each of the nodes in the AMF Network.

```
AMF-Net[3]# show running-config trigger
```

This command returns the following display:

```
=====
Node1:
```

```
=====

trigger 1
 type periodic 2
 script 1 atmf.scp
trigger 5
 type atmf node leave
description "E-mail on ATMF Exit"
 script 1 email_me.scp
!

=====
Node2, Node3:
=====

trigger 5
 type atmf node leave
description "E-mail on ATMF Exit"
 script 1 email_me.scp
!
```

**Related** [show trigger](#)  
**commands**



# type cpu

**Overview** This command configures a trigger to activate based on CPU usage level. Selecting the **up** option causes the trigger to activate when the CPU usage exceeds the specified usage level. Selecting the **down** option causes the trigger to activate when CPU usage drops below the specified usage level. Selecting **any** causes the trigger to activate in both situations. The default is **any**.

**Syntax** type cpu <1-100> [up|down|any]

| Parameter | Description                                                            |
|-----------|------------------------------------------------------------------------|
| <1-100>   | The percentage of CPU usage at which to trigger.                       |
| up        | Activate when CPU usage exceeds the specified level.                   |
| down      | Activate when CPU usage drops below the specified level                |
| any       | Activate when CPU usage passes the specified level in either direction |

**Mode** Trigger Configuration

**Usage notes** For an example trigger configuration that uses the **type cpu** command, see "Capture Unusual CPU and RAM Activity" in the [Triggers Feature Overview and Configuration Guide](#).

**Examples** To configure trigger 28 to be a CPU trigger that activates when CPU usage exceeds 80% use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 28
awplus(config-trigger)# type cpu 80 up
```

To configure trigger 5 to be a CPU trigger that activates when CPU usage either rises above or drops below 65%, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 5
awplus(config-trigger)# type cpu 65
```

or

```
awplus# configure terminal
awplus(config)# trigger 5
awplus(config-trigger)# type cpu 65 any
```

**Related** [show trigger](#)  
**commands** [trigger](#)

## type env-sensor

**Overview** Use this command to create a trigger that will run a script when the device's environment sensors detect an event. Environment sensors are shown in the output of the command **show system environment**, and include things like device temperature, power settings and voltage.

Depending on the device and sensor, you can create a trigger to run when:

- the sensor's state changes, for example when a loss of power is detected for a power supply, or when power is restored, or both.
- the sensor's reading crosses a high or low threshold, for example when the device temperature becomes too high, or returns to normal, or both.

**Syntax when a sensor changes state** `type env-sensor resource <resource-id> sensor <sensor-id> state {true|false|any}`

| Parameter                 | Description                                                                                                                    |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| resource<br><resource-id> | The 'Resource ID' for the device, as shown in output of the command <b>show system environment</b> .                           |
| sensor<br><sensor-id>     | The 'ID' for the sensor, as shown in output of the command <b>show system environment</b> .                                    |
| state true                | The trigger will activate if this sensor reading changes to 'Yes' or 'Open' in the output of <b>show system environment</b> .  |
| state false               | The trigger will activate if this sensor reading changes to 'No' or 'Closed' in the output of <b>show system environment</b> . |
| state any                 | The trigger will activate if this sensor reading changes to any of 'Yes', 'Open', 'No', or 'Closed'.                           |

**Syntax when a sensor crosses a threshold** type env-sensor resource <resource-id> sensor <sensor-id> {low-limit|high-limit} {exceeded|cleared|any}

| Parameter                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| resource<br><resource-id> | The 'Resource ID' for the device, as shown in output of the command <b>show system environment</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| sensor<br><sensor-id>     | The 'ID' for the sensor, as shown in output of the command <b>show system environment</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| low-limit                 | The trigger will activate when the sensor reading falls below the 'Low Limit' alarm threshold shown in <b>show system environment</b> , or returns to an acceptable value after being too low, or both. The alarm threshold values are pre-defined within the device and cannot be changed.                                                                                                                                                                                                                                                     |
| high-limit                | The trigger will activate when the sensor reading rises above the 'High Limit' alarm threshold shown in <b>show system environment</b> , or returns to an acceptable value after being too high, or both. The alarm threshold values are pre-defined within the device and cannot be changed.                                                                                                                                                                                                                                                   |
| exceeded                  | If you chose low-limit, the trigger will trigger if the sensor's reading falls below the low limit.<br><br>If you chose high-limit, the trigger will trigger if the sensor's reading goes above the high limit.                                                                                                                                                                                                                                                                                                                                 |
| cleared                   | If you chose low-limit, the trigger will trigger if the sensor's reading rises to above the low limit again.<br><br>If you chose high-limit, the trigger will trigger if the sensor's reading falls below the high limit again.<br><br>Some temperature sensors include a hysteresis value and will not clear until the temperature has changed significantly. For example, if a sensor has a high alarm threshold of 75 degrees Celsius, the hysteresis value may mean that the alarm clears when the temperature falls to 63 degrees Celsius. |
| any                       | The trigger will trigger if the low or high limit is either exceeded or cleared.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Mode Trigger Configuration

**Example** To configure trigger 1, which will activate when the internal temperature becomes too high or drops to a low-enough value after being too high, use the following commands. In this example, the monitored temperature has a resource ID of 4 and a sensor ID of 6:

```
awplus# configure terminal
awplus(config)# trigger 1
awplus(config-trigger)# type env-sensor resource 4 sensor 6
high-limit any
```

**Related commands** **show system environment**  
**show trigger**  
**trigger**

**Command changes** Version 5.5.2-1.1: command added

# type interface

**Overview** This command configures a trigger to activate based on the link status of an interface. The trigger can be activated when the interface becomes operational by using the **up** option, or when the interface closes by using the **down** option. The trigger can also be configured to activate when either one of these events occurs by using the **any** option.

**Syntax** type interface <interface> {up|down|any}

| Parameter   | Description                                           |
|-------------|-------------------------------------------------------|
| <interface> | Interface name.                                       |
| up          | Activate when interface becomes operational.          |
| down        | Activate when the interface closes.                   |
| any         | Activate when any interface link status event occurs. |

**Mode** Trigger Configuration

**Example** To configure trigger 19 to be an interface trigger that activates when port1.0.1 becomes operational, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 19
awplus(config-trigger)# type interface port1.0.1 up
```

**Related commands** [show trigger](#)  
[trigger](#)

## type linkmon-probe

**Overview** Use this command to create a trigger that will run a script when a Link Health Monitoring probe reports that a link becomes “good”, “bad”, or “unreachable”.

**Syntax** type linkmon-probe <probename> <profilename> {good|bad|unreachable|any}

| Parameter     | Description                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <probename>   | The name of the Link Health Monitoring probe that will be used for executing the trigger.                                                                    |
| <profilename> | The name of the Link Health Monitoring performance profile that will be used for determine if the Link Health Monitoring probe is good, bad, or unreachable. |
| good          | If the Link Health Monitoring probe becomes 'good' according to the Link Health Monitoring performance profile then the trigger will be executed.            |
| bad           | If the Link Health Monitoring probe goes 'bad' according to the Link Health Monitoring performance profile then the trigger will be executed.                |
| unreachable   | If the Link Health Monitoring probe becomes 'unreachable' according to the Link Health Monitoring performance profile then the trigger will be executed.     |
| any           | If the Link Health Monitoring probe changes state according to the Link Health Monitoring performance profile then the trigger will be executed.             |

**Mode** Trigger Configuration

**Example** When the Link Health Monitoring probes sent to the “test-probe” destination no longer meet the performance profile “test-profile” the link will be deemed “bad”. To create a trigger that will run a script when a Link Health Monitoring probe is deemed “bad”, use the following commands:

```
awplus(config)# trigger 1
awplus(config-trigger)# script 1 link-bad.scp
awplus(config-trigger)# type linkmon-probe test-probe test-profile bad
```

To create a trigger that will run a script when the link is deemed “good” again, use the following commands:

```
awplus(config)# trigger 2
awplus(config-trigger)# script 1 link-good.scp
awplus(config-trigger)# type linkmon-probe test-probe test-profile good
```

**Related trigger commands**

**Command changes** Version 5.4.8-1.1: command added



## type log

**Overview** Use this command to configure a trigger to activate based on the content of log messages matching a string or regular expression.

**Syntax** `type log <log-message-string>`

| Parameter                               | Description                                                                              |
|-----------------------------------------|------------------------------------------------------------------------------------------|
| <code>&lt;log-message-string&gt;</code> | A string or a regular expression (PCRE) to match a log message or part of a log message. |

**Default** There is no type or log message string set by default.

**Mode** Trigger Configuration

**Usage notes** Log type triggers fully support regular expressions using PCRE (Perl-Compatible Regular Expression) syntax.

Only log messages of severity level notice or higher can activate a trigger.

Note that any command executed by the script will generate a log message with level notice, and will include '[SCRIPT]' before the command string. Therefore, if something in the script matches the configured log message trigger string, it will retrigger indefinitely.

**Example** To configure trigger 6 to activate when a log message of level notice or higher indicates that any port has 'failed', use the commands:

```
awplus# configure terminal
awplus(config)# trigger 6
awplus(config-trigger)# type log port.+ failed
```

**Related commands** [show trigger](#)  
[trigger](#)

**Command changes** Version 5.4.7-2.1: command added

## type main-pse

**Overview** Use this command to monitor the total Power over Ethernet (PoE) power usage on the switch. This trigger activates if the amount of power being drawn exceeds the switch's PoE budget, or if it falls back within the budget again.

Note that the switch will take corrective action when the budget is exceeded. This means the amount of power will drop soon after the fault occurs.

**Syntax** type main-pse {up|down|any}

| Parameter | Description                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------|
| up        | Activate when the total power being drawn exceeds the PoE budget for the switch                                           |
| down      | Activate when the total power drawn falls back within the PoE budget for the switch                                       |
| any       | Activate both when the total power drawn exceeds the PoE budget for the switch and when it falls back within budget again |

**Mode** Trigger Configuration

**Example** To configure trigger 1, which will activate if the switch's power usage exceeds the PoE budget, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 1
awplus(config-trigger)# type main-pse up
```

**Related commands** [script](#)  
[show trigger](#)  
[type pse-port](#)

**Command changes** Version 5.5.3-1.1: command added

## type memory

**Overview** This command configures a trigger to activate based on RAM usage level. Selecting the **up** option causes the trigger to activate when memory usage exceeds the specified level. Selecting the **down** option causes the trigger to activate when memory usage drops below the specified level. Selecting **any** causes the trigger to activate in both situations. The default is **any**.

**Syntax** type memory <1-100> [up|down|any]

| Parameter | Description                                                                |
|-----------|----------------------------------------------------------------------------|
| <1-100>   | The percentage of memory usage at which to trigger.                        |
| up        | Activate when memory usage exceeds the specified level.                    |
| down      | Activate when memory usage drops below the specified level.                |
| any       | Activate when memory usage passes the specified level in either direction. |

**Mode** Trigger Configuration

**Examples** To configure trigger 12 to be a memory trigger that activates when memory usage exceeds 50% use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 12
awplus(config-trigger)# type memory 50 up
```

To configure trigger 40 to be a memory trigger that activates when memory usage either rises above or drops below 65%, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 40
awplus(config-trigger)# type memory 65

or

awplus# configure terminal
awplus(config)# trigger 40
awplus(config-trigger)# type memory 65 any
```

**Related commands** [show trigger](#)  
[trigger](#)

# type periodic

**Overview** This command configures a trigger to be activated at regular intervals. The time period between activations is specified in minutes.

**Syntax** type periodic <1-1440>

| Parameter | Description                                |
|-----------|--------------------------------------------|
| <1-1440>  | The number of minutes between activations. |

**Mode** Trigger Configuration

**Usage notes** A combined limit of 10 triggers of the type periodic and time can be configured. If you attempt to add more than 10 triggers the following error message is displayed:

% Cannot configure more than 10 triggers with the type time or periodic

For an example trigger configuration that uses the **type periodic** command, see "See Daily Statistics" in the [Triggers\\_Feature Overview and Configuration Guide](#).

**Example** To configure trigger 44 to activate periodically at 10 minute intervals use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 44
awplus(config-trigger)# type periodic 10
```

**Related commands** [show trigger](#)  
[trigger](#)

## type ping-poll

**Overview** This command configures a trigger that activates when Ping Polling identifies that a target device's status has changed. This allows you to run a configuration script when a device becomes reachable or unreachable.

**Syntax** type ping-poll <1-100> {up|down}

| Parameter | Description                                                                     |
|-----------|---------------------------------------------------------------------------------|
| <1-100>   | The ping poll ID.                                                               |
| up        | The trigger activates when ping polling detects that the target is reachable.   |
| down      | The trigger activates when ping polling detects that the target is unreachable. |

**Mode** Trigger Configuration

**Example** To configure trigger 106 to activate when ping poll 12 detects that its target device is now unreachable, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 106
awplus(config-trigger)# type ping-poll 12 down
```

**Related commands** [show trigger](#)  
[trigger](#)

# type pse-port

**Overview** Use this command to monitor an individual Power over Ethernet (PoE) port. This trigger activates if the amount of power being drawn by a port exceeds the capabilities of the port, or if it falls back within the limit again. Note that the switch will take corrective action when the port limit is exceeded, such as shutting down the affected port. This means the amount of power will drop soon after the fault occurs.

**Syntax** type pse-port <interface> {up|down|any}

| Parameter   | Description                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <interface> | The name of a PoE port.                                                                                                                                     |
| up          | Activate when the power drawn from the PoE port starts to exceed the port's capability to supply power.                                                     |
| down        | Activate when the power drawn from the PoE port stops exceeding the port's capability to supply power.                                                      |
| any         | Activate both when the power drawn from the PoE port starts to exceed the port's capability to supply power, and when it drops to a low enough value again. |

**Mode** Trigger Configuration

**Example** To configure trigger 1, which will activate if port1.0.1 draws too much power, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 1
awplus(config-trigger)# type pse-port port1.0.1 up
```

To configure trigger 1, which will activate if port1.0.1 draws too much power and also when it stops drawing too much power, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 1
awplus(config-trigger)# type pse-port port1.0.1 any
```

**Related commands** [script](#)  
[show trigger](#)  
[type main-pse](#)

**Command changes** Version 5.5.3-1.1: command added

# type reboot

**Overview** This command configures a trigger that activates when your device is rebooted.

**Syntax** type reboot

**Mode** Trigger Configuration

**Example** To configure trigger 32 to activate when your device reboots, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 32
awplus(config-trigger)# type reboot
```

**Related commands** [show trigger](#)  
[trigger](#)

# type time

**Overview** This command configures a trigger that activates at a specified time of day.

**Syntax** type time <hh:mm>

| Parameter | Description                       |
|-----------|-----------------------------------|
| <hh:mm>   | The time to activate the trigger. |

**Mode** Trigger Configuration

**Usage** A combined limit of 10 triggers of the type time and type periodic can be configured. If you attempt to add more than 10 triggers the following error message is displayed:

```
% Cannot configure more than 10 triggers with the type time or
periodic
```

**Example** To configure trigger 86 to activate at 15:53, use the following commands:

```
awplus# configure terminal
awplus(config)# trigger 86
awplus(config-trigger)# type time 15:53
```

**Related commands** [show trigger](#)  
[trigger](#)



# type usb

**Overview** Use this command to configure a trigger that activates on either the removal or the insertion of a USB storage device.

**Syntax** type usb {in|out}

| Parameter | Description                                             |
|-----------|---------------------------------------------------------|
| in        | Trigger activates on insertion of a USB storage device. |
| out       | Trigger activates on removal of a USB storage device.   |

**Mode** Trigger Configuration

**Usage notes** USB triggers cannot execute script files from a USB storage device.

**Examples** To configure trigger 1 to activate on the insertion of a USB storage device, use the commands:

```
awplus# configure terminal
awplus(config)# trigger 1
awplus(config-trigger)# type usb in
```

**Related commands** [trigger](#)  
[show running-config trigger](#)  
[show trigger](#)

# undebug trigger

**Overview** This command applies the functionality of the **no debug trigger** command.

# 66

## Ping-Polling Commands

- Contents**
- **Introduction** on page 3520
  - **active (ping-polling)** on page 3521
  - **clear ping-poll** on page 3522
  - **critical-interval** on page 3523
  - **debug ping-poll** on page 3524
  - **description (ping-polling)** on page 3525
  - **fail-count** on page 3526
  - **ip (ping-polling)** on page 3528
  - **length (ping-poll data)** on page 3529
  - **normal-interval** on page 3530
  - **ping-poll** on page 3531
  - **sample-size** on page 3532
  - **show counter ping-poll** on page 3534
  - **show ping-poll** on page 3537
  - **source-ip** on page 3541
  - **timeout (ping polling)** on page 3543
  - **up-count** on page 3544
  - **undebg ping-poll** on page 3545

# Introduction

**Overview** This chapter provides an alphabetical reference for commands used to configure Ping Polling. For more information, see the [Ping Polling Feature Overview and Configuration Guide](#).

For information on filtering and saving command output, see the [“Getting Started with AlliedWare Plus” Feature Overview and Configuration Guide](#).

**The following table lists the default values when configuring a ping poll**

| Default           | Value                                                                       |
|-------------------|-----------------------------------------------------------------------------|
| Critical-interval | 1 second                                                                    |
| Description       | No description                                                              |
| Fail-count        | 5                                                                           |
| Length            | 32 bytes                                                                    |
| Normal-interval   | 30 seconds                                                                  |
| Sample-size       | 5                                                                           |
| Source-ip         | The IP address of the interface from which the ping packets are transmitted |
| Time-out          | 1 second                                                                    |
| Up-count          | 30                                                                          |

## active (ping-polling)

**Overview** This command enables a ping-poll instance. The polling instance sends ICMP echo requests to the device with the IP address specified by the **ip (ping-polling)** command.

By default, polling instances are disabled. When a polling instance is enabled, it assumes that the device it is polling is unreachable.

The **no** variant of this command disables a ping-poll instance. The polling instance no longer sends ICMP echo requests to the polled device. This also resets all counters for this polling instance.

**Syntax** active  
no active

**Mode** Ping-Polling Configuration

**Examples** To activate the ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# active
```

To disable the ping-poll instance 43 and reset its counters, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# no active
```

**Related commands** **debug ping-poll**  
**ip (ping-polling)**  
**ping-poll**  
**show ping-poll**

## clear ping-poll

**Overview** This command resets the specified ping poll, or all ping poll instances. This clears the ping counters, and changes the status of polled devices to unreachable. The polling instance changes to the polling frequency specified with the **critical-interval** command. The device status changes to reachable once the device responses have reached the **up-count**.

**Syntax** `clear ping-poll {<1-100>|all}`

| Parameter | Description                                                                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <1-100>   | A ping poll ID number. The specified ping poll instance has its counters cleared, and the status of the device it polls is changed to unreachable. |
| all       | Clears the counters and changes the device status of all polling instances.                                                                        |

**Mode** Privileged Exec

**Examples** To reset the ping poll instance 12, use the command:

```
awplus# clear ping-poll 12
```

To reset all ping poll instances, use the command:

```
awplus# clear ping-poll all
```

**Related commands** **active (ping-polling)**  
**ping-poll**  
**show ping-poll**

# critical-interval

**Overview** This command specifies the time period in seconds between pings when the polling instance has not received a reply to at least one ping, and when the device is unreachable.

This command enables the device to quickly observe changes in state, and should be set to a much lower value than the **normal-interval** command.

The **no** variant of this command sets the critical interval to the default of one second.

**Syntax** critical-interval <1-65536>  
no critical-interval

| Parameter | Description                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------|
| <1-65536> | Time in seconds between pings, when the device has failed to a ping, or the device is unreachable. |

**Default** The default is 1 second.

**Mode** Ping-Polling Configuration

**Examples** To set the critical interval to 2 seconds for the ping-polling instance 99, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 99
awplus(config-ping-poll)# critical-interval 2
```

To reset the critical interval to the default of one second for the ping-polling instance 99, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 99
awplus(config-ping-poll)# no critical-interval
```

**Related commands** **fail-count**  
**normal-interval**

**sample-size**

**show ping-poll**

**timeout (ping polling)**

**up-count**

# debug ping-poll

**Overview** This command enables ping poll debugging for the specified ping-poll instance. This generates detailed messages about ping execution.

The **no** variant of this command disables ping-poll debugging for the specified ping-poll.

**Syntax** debug ping-poll <1-100>  
no debug ping-poll {<1-100>|all}

| Parameter | Description                       |
|-----------|-----------------------------------|
| <1-100>   | A unique ping poll ID number.     |
| all       | Turn off all ping-poll debugging. |

**Mode** Privileged Exec

**Examples** To enable debugging for ping-poll instance 88, use the command:

```
awplus# debug ping-poll 88
```

To disable all ping poll debugging, use the command:

```
awplus# no debug ping-poll all
```

To disable debugging for ping-poll instance 88, use the command:

```
awplus# no debug ping-poll 88
```

**Related commands**

- active (ping-polling)**
- clear ping-poll**
- ping-poll**
- show ping-poll**
- undebug ping-poll**



# description (ping-polling)

**Overview** This command specifies a string to describe the ping-polling instance. This allows the ping-polling instance to be recognized easily in show commands. Setting this command is optional.

By default ping-poll instances do not have a description.

Use the **no** variant of this command to delete the description set.

**Syntax** `description <description>`  
`no description`

| Parameter                        | Description                                                                                                                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;description&gt;</code> | The description of the target. Valid characters are any printable character and spaces. There is no maximum character length. |

**Mode** Ping-Polling Configuration

**Examples** To add the text "Primary Gateway" to describe the ping-poll instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# description Primary Gateway
```

To delete the description set for the ping-poll instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# no description
```

**Related commands** [ping-poll](#)  
[show ping-poll](#)

# fail-count

**Overview** This command specifies the number of pings that must be unanswered, within the total number of pings specified by the **sample-size** command, for the ping-polling instance to consider the device unreachable.

If the number set by the **sample-size** command and the **fail-count** commands are the same, then the unanswered pings must be consecutive. If the number set by the **sample-size** command is greater than the number set by the **fail-count** command, then a device that does not always reply to pings may be declared unreachable.

The **no** variant of this command resets the fail count to the default.

**Syntax** fail-count <1-100>  
no fail-count

| Parameter | Description                                                                                                                        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------|
| <1-100>   | The number of pings within the sample size that a reachable device must fail to respond to before it is classified as unreachable. |

**Default** The default is 5.

**Mode** Ping-Polling Configuration

**Examples** To specify the number of pings that must fail within the sample size to determine that a device is unreachable for ping-polling instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# fail-count 5
```

To reset the fail-count to its default of 5 for ping-polling instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# no fail-count
```

**Related commands**

- critical-interval**
- normal-interval**
- ping-poll**
- sample-size**
- show ping-poll**
- timeout (ping polling)**
- up-count**

# ip (ping-polling)

**Overview** This command specifies the IPv4 address of the device you are polling.

**Syntax** `ip {<ip-address>|<ipv6-address>}`

| Parameter                         | Description                                        |
|-----------------------------------|----------------------------------------------------|
| <code>&lt;ip-address&gt;</code>   | An IPv4 address in dotted decimal notation A.B.C.D |
| <code>&lt;ipv6-address&gt;</code> | An IPv6 address in hexadecimal notation X:X::X:X   |

**Mode** Ping-Polling Configuration

**Examples** To set ping-poll instance 5 to poll the device with the IP address 192.168.0.1, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 5
awplus(config-ping-poll)# ip 192.168.0.1
```

To set ping-poll instance 10 to poll the device with the IPv6 address 2001:db8::, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 10
awplus(config-ping-poll)# ip 2001:db8::
```

**Related commands**

- [ping-poll](#)
- [source-ip](#)
- [show ping-poll](#)

## length (ping-poll data)

**Overview** This command specifies the number of data bytes to include in the data portion of the ping packet. This allows you to set the ping packets to a larger size if you find that larger packet types in your network are not reaching the polled device, while smaller packets are getting through. This encourages the polling instance to change the device's status to unreachable when the network is dropping packets of the size you are interested in.

The **no** variant of this command resets the data bytes to the default of 32 bytes.

**Syntax** length <4-1500>  
no length

| Parameter | Description                                                                 |
|-----------|-----------------------------------------------------------------------------|
| <4-1500>  | The number of data bytes to include in the data portion of the ping packet. |

**Default** The default is 32.

**Mode** Ping-Polling Configuration

**Examples** To specify that ping-poll instance 12 sends ping packet with a data portion of 56 bytes, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 12
awplus(config-ping-poll)# length 56
```

To reset the number of data bytes in the ping packet to the default of 32 bytes for ping-poll instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 12
awplus(config-ping-poll)# length
```

**Related commands** [ping-poll](#)  
[show ping-poll](#)

# normal-interval

**Overview** This command specifies the time period between pings when the device is reachable.

The **no** variant of this command resets the time period to the default of 30 seconds.

**Syntax** normal-interval <1-65536>  
no normal-interval

| Parameter | Description                                                 |
|-----------|-------------------------------------------------------------|
| <1-65536> | Time in seconds between pings when the target is reachable. |

**Default** The default is 30 seconds.

**Mode** Ping-Polling Configuration

**Examples** To specify a time period of 60 seconds between pings when the device is reachable for ping-poll instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# normal-interval 60
```

To reset the interval to the default of 30 seconds for ping-poll instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# no normal-interval
```

**Related commands**

- [critical-interval](#)
- [fail-count](#)
- [ping-poll](#)
- [sample-size](#)
- [show ping-poll](#)
- [timeout \(ping polling\)](#)
- [up-count](#)

# ping-poll

**Overview** This command enters the ping-poll configuration mode. If a ping-poll exists with the specified number, then this command enters its configuration mode. If no ping poll exists with the specified number, then this command creates a new ping poll with this ID number.

To configure a ping-poll, create a ping poll using this command, and use the **ip (ping-polling)** command to specify the device you want the polling instance to poll. It is not necessary to specify any further commands unless you want to change a command's default.

The **no** variant of this command deletes the specified ping poll.

**Syntax** ping-poll <1-100>  
no ping-poll <1-100>

| Parameter | Description                   |
|-----------|-------------------------------|
| <1-100>   | A unique ping poll ID number. |

**Mode** Global Configuration

**Examples** To create ping-poll instance 3 and enter ping-poll configuration mode, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 3
awplus(config-ping-poll)#
```

To delete ping-poll instance 3, use the commands:

```
awplus# configure terminal
awplus(config)# no ping-poll 3
```

**Related commands**

- active (ping-polling)**
- clear ping-poll**
- debug ping-poll**
- description (ping-polling)**
- ip (ping-polling)**
- length (ping-poll data)**
- show ping-poll**
- source-ip**

## sample-size

**Overview** This command sets the total number of pings that the polling instance inspects when determining whether a device is unreachable. If the number of pings specified by the **fail-count** command go unanswered within the inspected sample, then the device is declared unreachable.

If the numbers set in this command and **fail-count** command are the same, the unanswered pings must be consecutive. If the number set by this command is greater than that set with the **fail-count** command, a device that does not always reply to pings may be declared unreachable.

You cannot set this command's value lower than the **fail-count** value.

The polling instance uses the number of pings specified by the **up-count** command to determine when a device is reachable.

The **no** variant of this command resets this command to the default.

**Syntax** sample-size <1-100>  
no sample size

| Parameter | Description                                             |
|-----------|---------------------------------------------------------|
| <1-100>   | Number of pings that determines critical and up counts. |

**Default** The default is 5.

**Mode** Ping-Polling Configuration

**Examples** To set the sample-size to 50 for ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# sample-size 50
```

To reset sample-size to the default of 5 for ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# no sample-size
```



**Related**  
**commands**

- critical-interval**
- fail-count**
- normal-interval**
- ping-poll**
- show ping-poll**
- timeout (ping polling)**
- up-count**

# show counter ping-poll

**Overview** This command displays the counters for ping polling.

**Syntax** show counter ping-poll [<1-100>]

| Parameter | Description                                                                                                                                                                           |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <1-100>   | A unique ping poll ID number. This displays the counters for the specified ping poll only. If you do not specify a ping poll, then this command displays counters for all ping polls. |

**Mode** User Exec and Privileged Exec

**Example** To display counters for the polling instances, use the command:

```
awplus# show counter ping-poll
```

**Output** The following shows typical output.

**Example output from the show counter ping-poll command**

```

Ping-polling counters
Ping-poll: 1
PingsSent 15
PingsFailedUpState 0
PingsFailedDownState 0
ErrorSendingPing 2
CurrentUpCount 13
CurrentFailCount 0
UpStateEntered 0
DownStateEntered 0

Ping-poll: 2
PingsSent 15
PingsFailedUpState 0
PingsFailedDownState 0
ErrorSendingPing 2
CurrentUpCount 13
CurrentFailCount 0
UpStateEntered 0
DownStateEntered 0

Ping-poll: 5
PingsSent 13
PingsFailedUpState 0
PingsFailedDownState 2
ErrorSendingPing 2
CurrentUpCount 9
CurrentFailCount 0
UpStateEntered 0
DownStateEntered 0

```

**Parameters in output of the show counter ping-poll command**

| Parameter            | Description                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ping-poll            | The ID number of the polling instance.                                                                                                                           |
| PingsSent            | The total number of pings generated by the polling instance.                                                                                                     |
| PingsFailedUpState   | The number of unanswered pings while the target device is in the Up state. This is a cumulative counter for multiple occurrences of the Up state.                |
| PingsFailedDownState | Number of unanswered pings while the target device is in the Down state. This is a cumulative counter for multiple occurrences of the Down state.                |
| ErrorSendingPing     | The number of pings that were not successfully sent to the target device.<br><br>This error can occur when your device does not have a route to the destination. |
| CurrentUpCount       | The current number of sequential ping replies.                                                                                                                   |

| Parameter        | Description                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------|
| CurrentFailCount | The number of ping requests that have not received a ping reply in the current sample-size window. |
| UpStateEntered   | Number of times the target device has entered the Up state.                                        |
| DownStateEntered | Number of times the target device has entered the Down state.                                      |

**Related commands**

- [debug ping-poll](#)
- [ping-poll](#)
- [show ping-poll](#)

# show ping-poll

**Overview** This command displays the settings and status of ping polls.

**Syntax** `show ping-poll [<1-100>|state {up|down}] [brief]`

| Parameter | Description                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------|
| <1-100>   | Displays settings and status for the specified polling instance.                                               |
| state     | Displays polling instances based on whether the device they are polling is currently reachable or unreachable. |
|           | up Displays polling instance where the device state is reachable.                                              |
|           | down Displays polling instances where the device state is unreachable.                                         |
| brief     | Displays a summary of the state of ping polls, and the devices they are polling.                               |

**Mode** User Exec and Privileged Exec

**Examples** To display the ping poll settings and the status of all the polls, use the command:

```
awplus# show ping-poll
```

To display a summary of the ping poll settings, use the command:

```
awplus# show ping-poll brief
```

To display the settings for ping poll 6, use the command:

```
awplus# show ping-poll 6
```

To display a summary of the state of ping poll 6, use the command:

```
awplus# show ping-poll 6 brief
```

To display the settings of ping polls that have reachable devices, use the command:

```
awplus# show ping-poll state up
```

To display a summary of ping polls that have unreachable devices, use the command:

```
awplus# show ping-poll state down brief
```

**Output** The following shows typical output.

### Example output from the show ping-poll brief command

| Ping Poll Configuration |         |       |               |
|-------------------------|---------|-------|---------------|
| -----                   |         |       |               |
| Id                      | Enabled | State | Destination   |
| -----                   |         |       |               |
| 1                       | Yes     | Down  | 192.168.0.1   |
| 2                       | Yes     | Up    | 192.168.0.100 |

### Parameters in output of the show ping-poll brief command

| Parameter   | Meaning                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Id          | The ID number of the polling instance, set when creating the polling instance with the <b>ping-poll</b> command.                                                |
| Enabled     | Whether the polling instance is enabled or disabled.                                                                                                            |
| State       | The current status of the device being polled:                                                                                                                  |
|             | Up                      The device is reachable.                                                                                                                |
|             | Down                    The device is unreachable.                                                                                                              |
|             | Critical Up            The device is reachable but recently the polling instance has not received some ping replies, so the polled device may be going down.    |
|             | Critical Down          The device is unreachable but the polling instance received a reply to the last ping packet, so the polled device may be coming back up. |
| Destination | The IP address of the polled device, set with the <b>ip (ping-polling)</b> command.                                                                             |

### Example output from the show ping-poll command

| Ping Poll Configuration |                   |
|-------------------------|-------------------|
| -----                   |                   |
| Poll 1:                 |                   |
| Description             | : Primary Gateway |
| Destination IP address  | : 192.168.0.1     |
| Status                  | : Down            |
| Enabled                 | : Yes             |
| Source IP address       | : 192.168.0.10    |
| Critical interval       | : 1               |
| Normal interval         | : 30              |
| Fail count              | : 10              |
| Up count                | : 5               |
| Sample size             | : 50              |
| Length                  | : 32              |
| Timeout                 | : 1               |
| Debugging               | : Enabled         |

```

Poll 2:
Description : Secondary Gateway
Destination IP address : 192.168.0.100
Status : Up
Enabled : Yes
Source IP address : Default
Critical interval : 5
Normal interval : 60
Fail count : 20
Up count : 30
Sample size : 100
Length : 56
Timeout : 2
Debugging : Enabled

```

### Parameters in output of the show ping-poll command

| Parameter              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------|------|----------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Description            | Optional description set for the polling instance with the <b>description (ping-polling)</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Destination IP address | The IP address of the polled device, set with the <b>ip (ping-polling)</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Status                 | <div>The current status of the device being polled:</div> <table> <tr> <td>Up</td><td>The device is reachable.</td></tr> <tr> <td>Down</td><td>The device is unreachable.</td></tr> <tr> <td>Critical Up</td><td>The device is reachable but recently the polling instance has not received some ping replies, so the polled device may be going down.</td></tr> <tr> <td>Critical Down</td><td>The device is unreachable but the polling instance received a reply to the last ping packet, so the polled device may be coming back up.</td></tr> </table> | Up | The device is reachable. | Down | The device is unreachable. | Critical Up | The device is reachable but recently the polling instance has not received some ping replies, so the polled device may be going down. | Critical Down | The device is unreachable but the polling instance received a reply to the last ping packet, so the polled device may be coming back up. |
| Up                     | The device is reachable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Down                   | The device is unreachable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Critical Up            | The device is reachable but recently the polling instance has not received some ping replies, so the polled device may be going down.                                                                                                                                                                                                                                                                                                                                                                                                                       |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Critical Down          | The device is unreachable but the polling instance received a reply to the last ping packet, so the polled device may be coming back up.                                                                                                                                                                                                                                                                                                                                                                                                                    |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Enabled                | Whether the polling instance is enabled or disabled. The <b>active (ping-polling)</b> and <b>active (ping-polling)</b> commands enable and disable a polling instance.                                                                                                                                                                                                                                                                                                                                                                                      |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Source IP address      | The source IP address sent in the ping packets. This is set using the <b>source-ip</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Critical interval      | The time period in seconds between pings when the polling instance has not received a reply to at least one ping, and when the device is unreachable. This is set with the <b>critical-interval</b> command.                                                                                                                                                                                                                                                                                                                                                |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |
| Normal interval        | The time period between pings when the device is reachable. This is set with the <b>normal-interval</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |                          |      |                            |             |                                                                                                                                       |               |                                                                                                                                          |

| Parameter   | Description                                                                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fail count  | The number of pings that must be unanswered, within the total number of pings specified by the <b>sample-size</b> command, for the polling instance to consider the device unreachable. This is set using the <b>fail-count</b> command. |
| Up count    | The number of consecutive pings that the polling instance must receive a reply to before classifying the device reachable again. This is set using the <b>up-count</b> command.                                                          |
| Sample size | The total number of pings that the polling instance inspects when determining whether a device is unreachable. This is set using the <b>sample-size</b> command.                                                                         |
| Length      | The number of data bytes to include in the data portion of the ping packet. This is set using the <b>length (ping-poll data)</b> command.                                                                                                |
| Timeout     | The time in seconds that the polling instance waits for a response to a ping packet. This is set using the <b>timeout (ping polling)</b> command.                                                                                        |
| Debugging   | Indicates whether ping polling debugging is <b>Enabled</b> or <b>Disabled</b> .<br><br>This is set using the <b>debug ping-poll</b> command.                                                                                             |

**Related commands** **debug ping-poll**  
**ping-poll**



## source-ip

**Overview** This command specifies the source IP address to use in ping packets.

By default, the polling instance uses the address of the interface through which it transmits the ping packets. It uses the device's local interface IP address when it is set. Otherwise, the IP address of the interface through which it transmits the ping packets is used.

The **no** variant of this command resets the source IP in the packets to the device's local interface IP address.

**Syntax** `source-ip {<ip-address>|<ipv6-address>}`  
`no source-ip`

| Parameter                         | Description                                        |
|-----------------------------------|----------------------------------------------------|
| <code>&lt;ip-address&gt;</code>   | An IPv4 address in dotted decimal notation A.B.C.D |
| <code>&lt;ipv6-address&gt;</code> | An IPv6 address in hexadecimal notation X:X::X:X   |

**Mode** Ping-Polling Configuration

**Examples** To configure the ping-polling instance 43 to use the source IP address 192.168.0.1 in ping packets, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# source-ip 192.168.0.1
```

To configure the ping-polling instance 43 to use the source IPv6 address 2001:db8:: in ping packets, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# source-ip 2001:db8::
```

To reset the source IP address to the device's local interface IP address for ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# no source-ip
```

- Related commands

description (ping-polling)

ip (ping-polling)

length (ping-poll data)

ping-poll

show ping-poll

# timeout (ping polling)

**Overview** This command specifies the time in seconds that the polling instance waits for a response to a ping packet. You may find a higher time-out useful in networks where ping packets have a low priority.

The **no** variant of this command resets the set time out to the default of one second.

**Syntax** `timeout <1-30>`  
`no timeout`

| Parameter | Description                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------|
| <1-30>    | Length of time, in seconds, that the polling instance waits for a response from the polled device. |

**Default** The default is 1 second.

**Mode** Ping-Polling Configuration

**Examples** To specify the timeout as 5 seconds for ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# timeout 5
```

To reset the timeout to its default of 1 second for ping-poll instance 43, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 43
awplus(config-ping-poll)# no timeout
```

**Related commands**

- [critical-interval](#)
- [fail-count](#)
- [normal-interval](#)
- [ping-poll](#)
- [sample-size](#)
- [show ping-poll](#)
- [up-count](#)

# up-count

**Overview** This command sets the number of consecutive pings that the polling instance must receive a reply to before classifying the device reachable again.

The **no** variant of this command resets the up count to the default of 30.

**Syntax** up-count <1-100>  
no up-count

| Parameter | Description                                                                      |
|-----------|----------------------------------------------------------------------------------|
| <1-100>   | Number of replied pings before an unreachable device is classified as reachable. |

**Default** The default is 30.

**Mode** Ping-Polling Configuration

**Examples** To set the upcount to 5 consecutive pings for ping-polling instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# up-count 5
```

To reset the upcount to the default value of 30 consecutive pings for ping-polling instance 45, use the commands:

```
awplus# configure terminal
awplus(config)# ping-poll 45
awplus(config-ping-poll)# no up-count
```

**Related commands**

- [critical-interval](#)
- [fail-count](#)
- [normal-interval](#)
- [ping-poll](#)
- [sample-size](#)
- [show ping-poll](#)
- [timeout \(ping polling\)](#)

# undebug ping-poll

**Overview** This command applies the functionality of the no **debug ping-poll**.

# 67

## sFlow Commands

- Contents**
- **Introduction** on page 3547
  - **debug sflow** on page 3548
  - **debug sflow agent** on page 3549
  - **sflow agent** on page 3550
  - **sflow collector** on page 3552
  - **sflow collector id** on page 3553
  - **sflow collector max-datagram-size** on page 3555
  - **sflow enable** on page 3556
  - **sflow max-header-size** on page 3557
  - **sflow polling-interval** on page 3559
  - **sflow sampling-rate** on page 3560
  - **show debugging sflow** on page 3561
  - **show running-config sflow** on page 3563
  - **show sflow** on page 3564
  - **show sflow interface** on page 3566
  - **undebg sflow** on page 3567

# Introduction

**Overview** This chapter provides an alphabetical reference for sFlow commands.  
For more information, see the [sFlow Feature Overview and Configuration Guide](#).

# debug sflow

**Overview** This command enables sFlow® debug message logging, for sFlow sampling and polling activity on the specified ports. If no ports are specified, sampling and/or polling debug messages are enabled for all ports.

The **no** variant of this command disables sFlow sampling and or polling debug message logging on the ports selected. If no ports are specified, sampling and/or polling debug messages are disabled on all ports.

**Syntax** debug sflow [interface <port-list>] [sampling][polling]  
no debug sflow [interface <port-list>] [sampling][polling]

| Parameter   | Description                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| interface   | Interface information.                                                                                                                                                                                                                                                                                                                                                                        |
| <port-list> | The ports for which sFlow debug is to be enabled. The ports to display information about. The port list can be: <ul style="list-style-type: none"><li>• a switchport (e.g. port1.0.4)</li><li>• a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4)</li><li>• a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.</li></ul> |
| sampling    | Debug sFlow sampling for the specified port(s).                                                                                                                                                                                                                                                                                                                                               |
| polling     | Debug sFlow polling for the specified port(s).                                                                                                                                                                                                                                                                                                                                                |

**Default** The sFlow sampling and or polling debug is disabled.

**Mode** Privileged Exec

**Examples** To enable sFlow debug message logging for polling and sampling on port1.0.1 and port1.0.2, use the commands:

```
awplus# debug sflow interface port1.0.1,port1.0.2 sampling
polling
```

To enable logging and polling of sFlow debug messages for polling and sampling on all ports, use the command:

```
awplus# debug sflow sampling polling
```

**Related commands** [show debugging sflow](#)  
[no debug all](#)



# debug sflow agent

**Overview** This command enables sFlow® debug message logging that is not specific to particular ports. For example, sending an sFlow datagram to the collector.

The **no** variant of this command applies the command default.

**Syntax** debug sflow agent  
no debug sflow agent

**Default** The sFlow agent debug message logging (that is not port specific) is disabled.

**Mode** Privileged Exec

**Example** To enable logging of sFlow agent debug messages, use the following command:

```
awplus# debug sflow agent
```

**Related commands** [show debugging sflow](#)  
[debug sflow](#)

# sflow agent

**Overview** This command sets the sFlow® agent IP address on the switch. This address is inserted into every sFlow datagram sent from the sFlow agent switch to the sFlow collector device. The sFlow collector can then use this address to uniquely identify and to access the switch, such as for SNMP. We therefore recommend that you change this address as little as possible.

Although the agent address can be set to any valid IPv4 or IPv6 address; we recommended that you set the sFlow® agent IP address to be the **local address** that is configured on the switch. For information on local addresses and how to set them up, see the [interface \(to configure\)](#). This ensures that the sFlow collector can maintain connectivity to the switch irrespective of the addition or deletion of interfaces (each of which will have its own specific IP address). Note that sFlow is rendered inactive whenever the agent address is not set.

The **no** variant of this command applies its default setting to remove a configured address.

**Syntax** sflow agent {ip <ip-address>|ipv6 <ipv6-address>}  
no sflow agent {ip|ipv6}

| Parameter      | Description                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------|
| <ip-address>   | The IPv4 address of the switch that is acting as the sFlow agent.                                                   |
| <ipv6-address> | The IPv6 address of the switch that is acting as the sFlow agent.<br><br>The IPv6 address uses the format X:X::X:X. |

**Default** The sFlow agent address is unset.

**Mode** Global Configuration

**Examples** To set the sFlow agent (IPv4) address to 192.0.2.23, use the command:

```
awplus# configure terminal
awplus(config)# sflow agent ip 192.0.2.23
```

To remove the sFlow agent (IPv4) address, use the command:

```
awplus# configure terminal
awplus(config)# no sflow agent ip
```

To set the sFlow agent (IPv6) address to 2001:0db8::1, use the command:

```
awplus# configure terminal
awplus(config)# sflow agent ipv6 2001:0db8::1
```

To remove the sFlow agent (IPv6) address, use the command:

```
awplus# configure terminal
awplus(config)# no sflow agent ipv6
```

**Related commands** [show running-config sflow](#)  
[show sflow](#)

# sflow collector

**Overview** This command has been deprecated. It has been replaced by the **sflow collector id** command.

This command sets the sFlow® agent's collector IP address and/or UDP port.

**Command changes** Version 5.5.1-1.1: command deprecated.

## sflow collector id

**Overview** Use this command to set the sFlow® agent's collector IP address and optionally the port and maximum datagram size. This is the destination IP address and UDP port, for sFlow datagrams sent from the sFlow agent. The IP address can be any valid IPv4 or IPv6 address.

Use the **no** variant of this command to remove the configuration for that collector and render it inactive.

**Syntax** sflow collector id <1-5> ip <ip-address> [port <1-65535>|max-datagram-size <200-1500>]  
sflow collector id <1-5> ipv6 <ipv6-address> [port <1-65535>|max-datagram-size <200-1500>]  
no sflow collector id <1-5>

| Parameter         | Description                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------|
| <ip-address>      | IPv4 address of the remote sFlow collector.                                                             |
| <ipv6-address>    | IPv6 address of remote sFlow collector.<br>The IPv6 address uses the format X:X::X:X.                   |
| port              | Destination UDP port for sFlow datagrams sent to the collector.                                         |
| <1-65535>         | UDP port number (default: 6343).                                                                        |
| max-datagram-size | The maximum number of bytes that can be sent in an sFlow datagram sent from the agent to the collector. |
| <200-1500>        | The value set for the max-datagram-size.                                                                |

**Default** By default the collector does not exist until configured with a valid IP address.

**Mode** Global Configuration

**Examples** To set the address of collector 1 to 192.168.1.36 with default port and max-datagram size, use the commands:

```
awplus# configure terminal
awplus(config)# sflow collector id 1 ip 192.168.1.36
```

To set the address of collector 2 to 12ae::213d::213d::333f and use UDP port 500, use the commands:

```
awplus# configure terminal
awplus(config)# sflow collector id 2 ipv6 12ae::213d::213d::333f
port 500
```

To set the address of collector 5 to 10.42.2.70 and use UDP port 7777 and have a max-datagram-size of 800, use the commands:

```
awplus# configure terminal
awplus(config)# sflow collector id 5 ip 10.42.2.70 port 7777
max-datagram-size 800
```

To delete collector 5, use the commands:

```
awplus# configure terminal
awplus(config)# no sflow collector id 5
```

**Related commands** [show running-config sflow](#)  
[show sflow](#)

**Command changes** Version 5.5.1-1.1: command added.

# sflow collector max-datagram-size

**Overview** This command has been deprecated. It has been replaced by the **sflow collector id** command.

This command sets the maximum size of the sFlow® datagrams sent to the collector.

**Command changes** Version 5.5.1-1.1: command deprecated

# sflow enable

**Overview** This command enables sFlow® globally on the switch.

The **no** variant of this command disables sFlow globally on the switch.

Note that enabling sFlow does not automatically set its operational status to active. To activate sFlow the following conditions need to be met:

- sFlow is enabled.
- The sFlow agent address is set.
- The sFlow collector address is set to a valid (non zero) IPv4 or IPv6 address.
- Polling or sampling is enabled on the ports to be sampled or polled.

**Syntax** sflow enable  
no sflow enable

**Default** sFlow is disabled globally on the switch.

**Mode** Global Configuration

**Example** To enable sFlow operation, use the command:

```
awplus# configure terminal
awplus(config)# sflow enable
```

**Related commands** [show running-config sflow](#)  
[show sflow](#)



## sflow max-header-size

**Overview** This command sets the maximum header size of the Ethernet frames sampled on a specified port. The maximum header size is measured in bytes, referenced from the first byte of the Ethernet destination address and excludes the Ethernet FCS fields.

If a sampled Ethernet frame is longer than the maximum header size set by this command, then the frame will be truncated to the first N bytes before being placed in the sFlow datagram, where N is the maximum header size set by this command.

The **no** variant of this command resets the max-header-size to its default.

**Syntax** sflow max-header-size <14-200>  
no sflow max-header-size

| Parameter | Description                                       |
|-----------|---------------------------------------------------|
| <14-200>  | The maximum number of header bytes to be sampled. |

**Default** The max-header-size is 128 bytes.

**Mode** Interface Configuration

**Usage notes** The header size is measured from the first byte of the Ethernet frame MAC Destination Address.

- For an environment using standard TCP IPv4 over Ethernet frames, consider the following basic protocol structure:

Ethernet header (including the 4 byte 802.1Q header component) = 18 bytes

IPv4 header = 24 bytes

TCP header = 24 bytes

Total = 66 bytes



**CAUTION:** For IPv4, any data existing between 66 bytes and the value set by this command will be included in the sFlow packet samples. For example, with the default of 128 applied, up to  $128 - 66 = 62$  bytes of user data could be included in the sFlow datagram samples sent between the Agent and the Collector.

For more information, see the [sFlow Feature Overview and Configuration Guide](#).

- A similar consideration can be made for an environment using TCP IPv6 over Ethernet:

Ethernet header (including the 4 byte 802.1Q header component) = 18 bytes

IPv6 header = 40 bytes

TCP header = 24 bytes

Total = 82 bytes



**CAUTION:** For IPv6, any data existing between 82 bytes and the value set by this command will be included in the sFlow packet samples. For example, with the default of 128 applied, up to  $128 - 82 = 46$  bytes of user data could be included in the sFlow datagram samples sent between the Agent and the Collector.

Note that the agent-to-collector datagrams contain their own UDP headers, which are outside this calculation.

**Example** To set the maximum header size to 160 bytes for port1.0.1 and port1.0.8, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.8
awplus(config-if)# sflow max-header-size 160
```

**Related commands** [show running-config sflow](#)  
[show sflow interface](#)  
[sflow max-header-size](#)

# sflow polling-interval

**Overview** This command sets the sFlow® counter polling interval (in seconds) for the specified ports. A value of 0 disables polling. A counter sample is taken every N seconds where N is the value set by this command.

The **no** variant of this command applies the default.

**Syntax** sflow polling-interval {0|<1-16777215>}  
no sflow polling-interval

| Parameter    | Description                      |
|--------------|----------------------------------|
| 0            | Disable polling (the default).   |
| <1-16777215> | The polling interval in seconds. |

**Default** The polling-interval is 0 (polling disabled).

**Mode** Interface Configuration

**Example** To set the polling interval to 60 seconds for port1.0.1 and port1.0.4, use the following commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.4
awplus(config-if)# sflow polling-interval 60
```

**Related commands** [show running-config sflow](#)  
[show sflow interface](#)

# sflow sampling-rate

**Overview** This command sets the mean sFlow® sampling rate for the specified ports. Sampling occurs every N frames (on average), where N is the rate value set via this command. The sampling rate applies to ingress and egress frames independently. For example, a value of 1000 will sample one frame in every 1000 frames received, i.e. one in every 1000 frames sent from the specified port. A value of 0 disables sampling on the specified port(s).

The **no** variant of this command applies the default.

**Syntax** sflow sampling-rate <50-2147483647>  
no sflow sampling-rate

| Parameter       | Description                                       |
|-----------------|---------------------------------------------------|
| <50-2147483647> | The sampling rate N, measured in Ethernet frames. |

**Default** The sampling-rate is 0 (sampling disabled).

**Mode** Interface Configuration

**Example** To set the sampling rate to 500 for port1.0.1 and port1.0.3, use the commands:

```
awplus# configure terminal
awplus(config)# interface port1.0.1,port1.0.3
awplus(config-if)# sflow sampling-rate 500
```

**Related commands** [show running-config sflow](#)  
[show sflow interface](#)

## show debugging sflow

**Overview** This command displays sFlow® debug settings for agent operation, and for sampling and polling on specific interface ports. If no interface ports are specified, sampling and polling will be applied to all ports.

**Syntax** show debugging sflow [interface *<port-list>*]

| Parameter                | Description                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| interface                | The interface information.                                                                                                                                                                                                                                                                                                                                                                                |
| <i>&lt;port-list&gt;</i> | The ports for which the sFlow debug settings are to be shown. The ports to display information about. The port list can be: <ul style="list-style-type: none"><li>• a switchport (e.g. port1.0.4)</li><li>• a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4)</li><li>• a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.</li></ul> |

**Mode** User Exec and Privileged Exec

**Example** To display sFlow debug settings for all ports, use the command:

```
awplus# show debugging sflow
```

To display sFlow debug settings on the agent, and for sampling and polling on port1.0.1 to port1.0.8, use the command:

```
awplus# show debugging sflow interface port1.0.1-port1.0.8
```

**Output** The following shows typical output.

### Sample obtained for an sFlow agent

|                                                            |                |               |
|------------------------------------------------------------|----------------|---------------|
| awplus# show debugging sflow interface port1.0.1-port1.0.8 |                |               |
| sFlow Agent Debug: Enabled                                 |                |               |
| Port                                                       | Sampling Debug | Polling Debug |
| -----                                                      |                |               |
| port1.0.1                                                  | Enabled        | Enabled       |
| port1.0.2                                                  | Enabled        | -             |
| port1.0.3                                                  | -              | -             |
| port1.0.4                                                  | -              | -             |
| ...                                                        |                |               |
| port1.0.8                                                  | -              | Enabled       |

**Related commands** [show running-config sflow](#)  
[show sflow interface](#)

# show running-config sflow

**Overview** This command displays the running system information specific to the sFlow feature.

**Syntax** show running-config sflow

**Mode** Privileged Exec and Global Configuration

**Example** To display the sFlow running configuration information, use the command:  
awplus# show running-config sflow

**Output** The following shows typical output.

## Example output from the show running-config sflow command

```
awplus#sh run sflow
!
sflow agent ip 192.0.2.33
sflow collector ip 192.0.2.65
sflow collector max-datagram-size 1200
sflow enable
!
interface port1.0.1-port1.0.4
 sflow sampling-rate 512
```

**Related commands** [show running-config](#)

# show sflow

**Overview** This command displays non-port-specific sFlow agent configuration and operational status.

**Syntax** show sflow

**Mode** Privileged Exec

**Example** To display sFlow configuration and operational status, use the command:  
awplus# show sflow



**Output** The following shows typical output.

**Example output from the show sflow command**

|                                            |           |                |
|--------------------------------------------|-----------|----------------|
| sFlow Agent Configuration:                 |           | Default Values |
| sFlow Admin Status .....                   | Disabled  | [Disabled]     |
| sFlow Agent Address .....                  | [not set] | [not set]      |
| Collector Address .....                    | 0.0.0.0   | [0.0.0.0]      |
| Collector UDP Port .....                   | 6343      | [6343]         |
| Tx Max Datagram Size .....                 | 1200      | [1400]         |
| sFlow Agent Status:                        |           |                |
| Polling/sampling/Tx .....                  |           |                |
| Inactive because:                          |           |                |
| - sFlow is disabled                        |           |                |
| - Agent Addr is not set                    |           |                |
| - Collector Addr is 0.0.0.0                |           |                |
| - Polling & sampling disabled on all ports |           |                |

**Parameters in the output of the show sflow command**

| Output Parameter     | Description                                                                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sFlow Admin Status   | Whether sFlow agent operation is administratively enabled.                                                                                                     |
| sFlow Agent Address  | The sFlow agent IPv4 or IPv6 address for the device. sFlow is rendered inactive whenever the agent address is not set.                                         |
| Collector Address    | The IPv4 or IPv6 collector address to which sFlow datagrams are sent. sFlow is rendered inactive whenever the collector address is set to 0.0.0.0 or 0:0::0.0. |
| Collector UDP Port   | The UDP port on the collector to which sFlow datagrams are sent.                                                                                               |
| Tx Max Datagram Size | The maximum size of the sFlow datagrams sent to the collector.                                                                                                 |
| Polling/sampling/Tx  | Whether sFlow sampling and/or polling (and hence sFlow datagram transmission) are active. If inactive the reasons are listed.                                  |

**Related commands** [show running-config sflow](#)  
[show sflow interface](#)

# show sflow interface

**Overview** This command displays sFlow agent sampling and polling configuration for all ports or a specified port.

**Syntax** show sflow interface [<ifrang>]

| Parameter | Description                                                                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ifrang>  | <ul style="list-style-type: none"><li>• a switchport (e.g. port1.0.4)</li><li>• a continuous range of ports separated by a hyphen (e.g. port1.0.1-1.0.4)</li><li>• a comma-separated list (e.g. port1.0.1,port1.0.3-1.0.4). Do not mix port types in the same list.</li></ul> |

**Mode** Privileged Exec

**Example** To display the sFlow sampling and polling configuration for port1.0.1, use the command:

```
awplus# show sflow interface port1.0.1
```

**Output** The following shows typical output.

## Example output from the show sflow interface command

|                                            |                                   |                               |                               |
|--------------------------------------------|-----------------------------------|-------------------------------|-------------------------------|
| awplus#show sflow interface                |                                   |                               |                               |
| sFlow Port Configuration:                  |                                   |                               |                               |
| Default Values:                            |                                   |                               |                               |
| Sampling Rate ..... 0 pkts (= disabled)    |                                   |                               |                               |
| Max Sample Header Size .. 128 bytes        |                                   |                               |                               |
| Polling Interval ..... 0 secs (= disabled) |                                   |                               |                               |
| Port                                       | Sampling<br>Rate<br>(1 in N pkts) | Max Header<br>Size<br>(bytes) | Polling<br>Interval<br>(secs) |
| -----                                      | -----                             | -----                         | -----                         |
| port1.0.1                                  | 0                                 | 128                           | 0                             |
| port1.0.1                                  | 0                                 | 128                           | 0                             |
| port1.0.1                                  | 0                                 | 128                           | 0                             |
| ...                                        |                                   |                               |                               |

**Related commands** [sflow enable](#)  
[show running-config sflow](#)  
[show sflow](#)

# undebug sflow

**Overview** This command applies the functionality of the **no** variant of the **debug sflow** command.