



HIRSCHMANN

A **BELDEN** BRAND

Reference Manual

Command Line Interface (CLI) HiOS (Global Overview)

The naming of copyrighted trademarks in this manual, even when not specially indicated, should not be taken to mean that these names may be considered as free in the sense of the trademark and tradename protection law and hence that they may be freely used by anyone.

© 2023 Hirschmann Automation and Control GmbH

Manuals and software are protected by copyright. All rights reserved. The copying, reproduction, translation, conversion into any electronic medium or machine scannable form is not permitted, either in whole or in part. An exception is the preparation of a backup copy of the software for your own use.

The performance features described here are binding only if they have been expressly agreed when the contract was made. This document was produced by Hirschmann Automation and Control GmbH according to the best of the company's knowledge. Hirschmann reserves the right to change the contents of this document without prior notice. Hirschmann can give no guarantee in respect of the correctness or accuracy of the information in this document.

Hirschmann can accept no responsibility for damages, resulting from the use of the network components or the associated operating software. In addition, we refer to the conditions of use specified in the license contract.

You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

Contents

Safety instructions	41
First login (Password change)	42
About this Manual	43
1 Address Conflict Detection (ACD)	44
1.1 address-conflict	44
1.1.1 address-conflict operation	44
1.1.2 address-conflict detection-mode	44
1.1.3 address-conflict detection-ongoing	44
1.1.4 address-conflict delay	44
1.1.5 address-conflict release-delay	44
1.1.6 address-conflict max-protection	45
1.1.7 address-conflict protect-interval	45
1.1.8 address-conflict trap-status	45
1.1.9 address-conflict routing trap	45
1.1.10 address-conflict routing probe	45
1.1.11 address-conflict routing clear	45
1.2 mac-address-conflict	45
1.2.1 mac-address-conflict operation	46
1.3 show	46
1.3.1 show address-conflict global	46
1.3.2 show address-conflict detected	46
1.3.3 show address-conflict fault-state	46
1.3.4 show address-conflict routing	46
1.3.5 show mac-address-conflict global	46
2 Access Control List (ACL)	47
2.1 mac	47
2.1.1 mac access-list extended name	47
2.1.2 mac access-list extended rename	48
2.1.3 mac access-list extended del	48
2.1.4 mac access-group name	48
2.1.5 mac access-group del	49
2.2 mac	49
2.2.1 mac access-list extended name	49
2.2.2 mac access-list extended rename	50
2.2.3 mac access-list extended del	51
2.2.4 mac access-group name	51
2.2.5 mac access-group del	51
2.3 mac	51
2.3.1 mac access-group name	51
2.3.2 mac access-group del	52
2.4 mac	52
2.4.1 mac access-group name	52
2.4.2 mac access-group del	52
2.5 ip	53
2.5.1 ip access-list extended name	53
2.5.2 ip access-list extended rename	57
2.5.3 ip access-list extended del	57
2.5.4 ip access-group name	57
2.5.5 ip access-group del	58
2.6 ip	58
2.6.1 ip access-group name	58
2.6.2 ip access-group del	58
2.7 show	59
2.7.1 show access-list global	59

2.7.2	show access-list mac	59
2.7.3	show access-list ip	59
2.7.4	show access-list assignment ip	59
2.7.5	show access-list assignment mac	59
3	Application Lists	60
3.1	appllists	60
3.1.1	appllists set-authlist	60
3.1.2	appllists enable	60
3.1.3	appllists disable	60
3.2	show	60
3.2.1	show appllists	60
4	Authentication Lists	61
4.1	authlists	61
4.1.1	authlists add	61
4.1.2	authlists delete	61
4.1.3	authlists set-policy	61
4.1.4	authlists enable	61
4.1.5	authlists disable	62
4.2	show	62
4.2.1	show authlists	62
5	Auto Disable	63
5.1	auto-disable	63
5.1.1	auto-disable reason	63
5.2	auto-disable	63
5.2.1	auto-disable timer	63
5.2.2	auto-disable reset	63
5.3	show	64
5.3.1	show auto-disable brief	64
5.3.2	show auto-disable reasons	64
6	Cabletest	65
6.1	cable-test	65
6.1.1	cable-test	65
7	Class Of Service	66
7.1	classofservice	66
7.1.1	classofservice ip-dscp-mapping	66
7.1.2	classofservice dot1p-mapping	69
7.2	classofservice	69
7.2.1	classofservice trust	69
7.3	cos-queue	69
7.3.1	cos-queue strict	69
7.3.2	cos-queue weighted	69
7.3.3	cos-queue max-bandwidth	69
7.3.4	cos-queue min-bandwidth	70
7.4	show	70
7.4.1	show classofservice ip-dscp-mapping	70
7.4.2	show classofservice dot1p-mapping	70
7.4.3	show classofservice trust	70
7.4.4	show cos-queue	70
8	Command Line Interface (CLI)	71
8.1	cli	71
8.1.1	cli serial-timeout	71
8.1.2	cli prompt	71
8.1.3	cli numlines	71
8.1.4	cli banner operation	71

8.1.5	cli banner text	71
8.2	show	72
8.2.1	show cli global	72
8.2.2	show cli command-tree	72
8.3	logging	72
8.3.1	logging cli-command	72
8.4	show	72
8.4.1	show logging cli-command	72
9	Clock	73
9.1	clock	73
9.1.1	clock set	73
9.1.2	clock timezone offset	73
9.1.3	clock timezone zone	73
9.1.4	clock summer-time mode	73
9.1.5	clock summer-time recurring start	73
9.1.6	clock summer-time recurring end	74
9.1.7	clock summer-time zone	74
9.2	show	75
9.2.1	show clock	75
10	Configuration	76
10.1	save	76
10.1.1	save profile	76
10.2	config	76
10.2.1	config watchdog admin-state	76
10.2.2	config watchdog timeout	76
10.2.3	config encryption password set	76
10.2.4	config encryption password clear	76
10.2.5	config envm choose-active	77
10.2.6	config envm log-device	77
10.2.7	config envm auto-update	77
10.2.8	config envm sshkey-auto-update	77
10.2.9	config envm config-save	77
10.2.10	config envm load-priority	78
10.2.11	config envm usb-compatibility	78
10.2.12	config profile select	78
10.2.13	config profile delete	78
10.2.14	config fingerprint verify nvm profile	78
10.2.15	config fingerprint verify nvm num	79
10.2.16	config fingerprint verify envm profile	79
10.2.17	config fingerprint verify envm num	79
10.2.18	config remote-backup operation	79
10.2.19	config remote-backup destination	79
10.2.20	config remote-backup username	79
10.2.21	config remote-backup password	79
10.3	copy	80
10.3.1	copy sysinfo system envm	80
10.3.2	copy sysinfoall system envm	80
10.3.3	copy firmware envm	80
10.3.4	copy firmware remote	80
10.3.5	copy config running-config nvm	80
10.3.6	copy config running-config remote	80
10.3.7	copy config nvm	81
10.3.8	copy config nvm running-config	81
10.3.9	copy config nvm remote	81
10.3.10	copy config envm	81
10.3.11	copy config remote	81
10.3.12	copy sfp-white-list remote	82
10.3.13	copy sfp-white-list envm	82
10.4	clear	82
10.4.1	clear config	82
10.4.2	clear factory	82
10.4.3	clear sfp-white-list	82

10.5	show	82
10.5.1	show running-config xml	82
10.5.2	show running-config script	83
10.6	show	83
10.6.1	show config envm settings	83
10.6.2	show config envm properties	83
10.6.3	show config envm active	83
10.6.4	show config envm usb-compatibility	83
10.6.5	show config watchdog	83
10.6.6	show config encryption	83
10.6.7	show config profiles	83
10.6.8	show config status	84
10.6.9	show config remote-backup	84
10.7	swap	84
10.7.1	swap firmware system backup	84
11	Dynamic ARP Inspection	85
11.1	ip	85
11.1.1	ip arp-inspection verify src-mac	85
11.1.2	ip arp-inspection verify dst-mac	85
11.1.3	ip arp-inspection verify ip	85
11.1.4	ip arp-inspection access-list add	85
11.1.5	ip arp-inspection access-list delete	86
11.1.6	ip arp-inspection access-list mode	86
11.1.7	ip arp-inspection access-list rule add	86
11.1.8	ip arp-inspection access-list rule delete	86
11.1.9	ip arp-inspection access-list rule mode	86
11.2	clear	86
11.2.1	clear ip arp-inspection statistics	87
11.3	ip	87
11.3.1	ip arp-inspection mode	87
11.3.2	ip arp-inspection log	87
11.3.3	ip arp-inspection bind-check	87
11.3.4	ip arp-inspection access-list strict	87
11.3.5	ip arp-inspection access-list assign	88
11.4	ip	88
11.4.1	ip arp-inspection trust	88
11.4.2	ip arp-inspection auto-disable	88
11.4.3	ip arp-inspection limit	88
11.5	show	89
11.5.1	show ip arp-inspection global	89
11.5.2	show ip arp-inspection statistics dropped	89
11.5.3	show ip arp-inspection statistics forwarded	89
11.5.4	show ip arp-inspection access-list names	89
11.5.5	show ip arp-inspection access-list rules	89
11.5.6	show ip arp-inspection interfaces	89
11.5.7	show ip arp-inspection vlan	89
12	Debugging	90
12.1	debug	90
12.1.1	debug tcpdump help	90
12.1.2	debug tcpdump start cpu	90
12.1.3	debug tcpdump stop	90
12.1.4	debug tcpdump filter show	90
12.1.5	debug tcpdump filter list	90
12.1.6	debug tcpdump filter delete	90
12.1.7	debug stppkttrace	90
12.2	show	91
12.2.1	show debug developer-log	91
12.2.2	show debug logic-modules	91
12.2.3	show debug stppkttrace	91
12.3	copy	91
12.3.1	copy tcpdumpcap nvram envm	91

12.3.2 copy tcpdumpcap nvm remote	91
12.3.3 copy tcpdumpfilter remote	91
12.3.4 copy tcpdumpfilter envm	92
12.3.5 copy tcpdumpfilter nvm	92
13 Device Monitoring	93
13.1 device-status	93
13.1.1 device-status monitor link-failure	93
13.1.2 device-status monitor temperature	93
13.1.3 device-status monitor module-removal	93
13.1.4 device-status monitor fan-failure	93
13.1.5 device-status monitor envm-removal	93
13.1.6 device-status monitor envm-not-in-sync	94
13.1.7 device-status monitor ring-redundancy	94
13.1.8 device-status monitor humidity	94
13.1.9 device-status monitor power-supply	94
13.1.10 device-status monitor stp-blocking	94
13.1.11 device-status monitor stp-blocking	95
13.1.12 device-status trap	95
13.1.13 device-status module	95
13.1.14 device-status fan-module	95
13.2 device-status	95
13.2.1 device-status link-alarm	96
13.3 show	96
13.3.1 show device-status monitor	96
13.3.2 show device-status state	96
13.3.3 show device-status trap	96
13.3.4 show device-status events	96
13.3.5 show device-status link-alarm	96
13.3.6 show device-status module	96
13.3.7 show device-status fan-module	96
13.3.8 show device-status all	97
14 Device Security	98
14.1 security-status	98
14.1.1 security-status monitor pwd-change	98
14.1.2 security-status monitor pwd-min-length	98
14.1.3 security-status monitor pwd-policy-config	98
14.1.4 security-status monitor pwd-str-not-config	98
14.1.5 security-status monitor pwd-policy-inactive	99
14.1.6 security-status monitor bypass-pwd-strength	99
14.1.7 security-status monitor telnet-enabled	99
14.1.8 security-status monitor http-enabled	99
14.1.9 security-status monitor snmp-unsecure	99
14.1.10 security-status monitor snmp-unsecure	100
14.1.11 security-status monitor sysmon-enabled	100
14.1.12 security-status monitor extnvm-upd-enabled	100
14.1.13 security-status monitor no-link-enabled	100
14.1.14 security-status monitor hidisc-enabled	100
14.1.15 security-status monitor extnvm-load-unsecure	101
14.1.16 security-status monitor iec61850-mms-enabled	101
14.1.17 security-status monitor https-certificate	101
14.1.18 security-status monitor modbus-tcp-enabled	101
14.1.19 security-status monitor ethernet-ip-enabled	101
14.1.20 security-status monitor profinet-io-enabled	102
14.1.21 security-status monitor pml-disabled	102
14.1.22 security-status trap	102
14.2 security-status	102
14.2.1 security-status no-link	102
14.3 show	102
14.3.1 show security-status monitor	103
14.3.2 show security-status state	103
14.3.3 show security-status no-link	103
14.3.4 show security-status trap	103
14.3.5 show security-status events	103
14.3.6 show security-status all	103

15	Dynamic Host Configuration Protocol (DHCP)	104
15.1	dhcp-server	104
15.1.1	dhcp-server operation	104
15.2	dhcp-server	104
15.2.1	dhcp-server operation	104
15.2.2	dhcp-server addr-probe	104
15.2.3	dhcp-server pool add	104
15.2.4	dhcp-server pool modify	105
15.2.5	dhcp-server pool mode	106
15.2.6	dhcp-server pool delete	106
15.3	show	106
15.3.1	show dhcp-server operation	106
15.3.2	show dhcp-server pool	106
15.3.3	show dhcp-server interface	106
15.3.4	show dhcp-server lease	106
16	DHCP Layer 2 Relay	107
16.1	dhcp-l2relay	107
16.1.1	dhcp-l2relay mode	107
16.2	dhcp-l2relay	107
16.2.1	dhcp-l2relay mode	107
16.2.2	dhcp-l2relay circuit-id	107
16.2.3	dhcp-l2relay remote-id ip	107
16.2.4	dhcp-l2relay remote-id mac	108
16.2.5	dhcp-l2relay remote-id client-id	108
16.2.6	dhcp-l2relay remote-id other	108
16.3	dhcp-l2relay	108
16.3.1	dhcp-l2relay mode	108
16.3.2	dhcp-l2relay trust	108
16.4	clear	108
16.4.1	clear dhcp-l2relay statistics	109
16.5	show	109
16.5.1	show dhcp-l2relay global	109
16.5.2	show dhcp-l2relay statistics	109
16.5.3	show dhcp-l2relay interfaces	109
16.5.4	show dhcp-l2relay vlan	109
17	DHCP Snooping	110
17.1	ip	110
17.1.1	ip dhcp-snooping verify-mac	110
17.1.2	ip dhcp-snooping mode	110
17.1.3	ip dhcp-snooping database storage	110
17.1.4	ip dhcp-snooping database write-delay	110
17.1.5	ip dhcp-snooping binding add	110
17.1.6	ip dhcp-snooping binding delete all	111
17.1.7	ip dhcp-snooping binding delete interface	111
17.1.8	ip dhcp-snooping binding delete mac	111
17.1.9	ip dhcp-snooping binding mode	111
17.2	clear	111
17.2.1	clear ip dhcp-snooping bindings	111
17.2.2	clear ip dhcp-snooping statistics	111
17.3	ip	112
17.3.1	ip dhcp-snooping mode	112
17.4	ip	112
17.4.1	ip dhcp-snooping trust	112
17.4.2	ip dhcp-snooping log	112
17.4.3	ip dhcp-snooping auto-disable	112
17.4.4	ip dhcp-snooping limit	113
17.5	show	113
17.5.1	show ip dhcp-snooping global	113

17.5.2	show ip dhcp-snooping statistics	113
17.5.3	show ip dhcp-snooping interfaces	113
17.5.4	show ip dhcp-snooping vlan	113
17.5.5	show ip dhcp-snooping bindings	113
18	Differentiated Services (DiffServ)	114
18.1	diffserv	114
18.1.1	diffserv	114
18.2	class-map	114
18.2.1	class-map match-all	114
18.2.2	class-map name match any	114
18.2.3	class-map name match class-map	114
18.2.4	class-map name match cos	115
18.2.5	class-map name match destination-address	115
18.2.6	class-map name match dstip	115
18.2.7	class-map name match dst14port	115
18.2.8	class-map name match ethertype	116
18.2.9	class-map name match ip dscp	116
18.2.10	class-map name match ip precedence	116
18.2.11	class-map name match ip tos	117
18.2.12	class-map name match protocol	117
18.2.13	class-map name match secondary-cos	117
18.2.14	class-map name match secondary-vlan	117
18.2.15	class-map name match source-address	118
18.2.16	class-map name match srcip	118
18.2.17	class-map name match src14port	118
18.2.18	class-map name match vlan	118
18.2.19	class-map remove	119
18.2.20	class-map rename	119
18.3	policy-map	119
18.3.1	policy-map create	119
18.3.2	policy-map name class add	119
18.3.3	policy-map name class name assign-queue	119
18.3.4	policy-map name class name conform-color	120
18.3.5	policy-map name class name drop	120
18.3.6	policy-map name class name mark	120
18.3.7	policy-map name class name mirror	121
18.3.8	policy-map name class name police-simple conform action drop violate-action	122
18.3.9	policy-map name class name police-simple conform action set-cos-as-sec-cos violate-action	123
18.3.10	policy-map name class name police-simple conform action set-cos-transmit violate-action	124
18.3.11	policy-map name class name police-simple conform action set-dscp-transmit violate-action	125
18.3.12	policy-map name class name police-simple conform action set-prec-transmit violate-action	126
18.3.13	policy-map name class name police-simple conform action set-sec-cos-transmit violate-action	127
18.3.14	policy-map name class name police-simple conform action transmit violate-action	128
18.3.15	policy-map name class name police-two-rate conform action ... exceed-action ... violate-action ...	129
18.3.16	policy-map name class name redirect	130
18.3.17	policy-map name class remove	131
18.3.18	policy-map rename	131
18.3.19	policy-map remove	131
18.4	service-policy	131
18.4.1	service-policy	131
18.5	service-policy	132
18.5.1	service-policy	132
18.6	show	132
18.6.1	show diffserv global	132
18.6.2	show diffserv service brief	132
18.6.3	show diffserv service interface	132
18.6.4	show class-map	133
18.6.5	show policy-map all	133

18.6.6	show policy-map interface	133
18.6.7	show policy-map name	133
18.6.8	show service-policy	133
19	Device Level Ring (DLR)	134
19.1	dlr	134
19.1.1	dlr operation	134
19.1.2	dlr ring add	134
19.1.3	dlr ring delete	134
19.1.4	dlr ring modify	134
19.1.5	dlr gateway	135
19.2	show	136
19.2.1	show dlr global	136
19.2.2	show dlr ring config	136
19.2.3	show dlr ring status	136
19.2.4	show dlr ring participants	136
19.2.5	show dlr gateway config	136
19.2.6	show dlr gateway status	136
20	Domain Name System (DNS)	137
20.1	dns	137
20.1.1	dns cache adminstate	137
20.1.2	dns cache flush	137
20.1.3	dns client adminstate	137
20.1.4	dns client cache adminstate	137
20.1.5	dns client cache flush	137
20.1.6	dns client domain-name	138
20.1.7	dns client host add	138
20.1.8	dns client host delete	138
20.1.9	dns client host modify	138
20.1.10	dns client source	138
20.1.11	dns client servers add	138
20.1.12	dns client servers delete	139
20.1.13	dns client servers modify	139
20.1.14	dns client servers enable	139
20.1.15	dns client servers disable	139
20.1.16	dns client timeout	139
20.1.17	dns client retry	139
20.2	show	139
20.2.1	show dns client hosts	140
20.2.2	show dns client info	140
20.2.3	show dns client servers	140
21	DoS Mitigation	141
21.1	dos	141
21.1.1	dos tcp-null	141
21.1.2	dos tcp-xmas	141
21.1.3	dos tcp-syn-fin	141
21.1.4	dos tcp-min-header	141
21.1.5	dos icmp-fragmented	141
21.1.6	dos icmp payload-check	142
21.1.7	dos icmp payload-size	142
21.1.8	dos ip-land	142
21.1.9	dos ip-src-route	142
21.1.10	dos tcp-offset	142
21.1.11	dos tcp-syn	143
21.1.12	dos l4-port	143
21.1.13	dos icmp-smurf-attack	143
21.2	show	143
21.2.1	show dos	143
22	IEEE 802.1as (Dot1as - Timing and Synchronization)	144
22.1	dot1as	144
22.1.1	dot1as operation	144

22.1.2	dot1as priority1	144
22.1.3	dot1as priority2	144
22.1.4	dot1as sync-lower-bound	144
22.1.5	dot1as sync-upper-bound	144
22.2	dot1as	144
22.2.1	dot1as operation	145
22.2.2	dot1as pdelay-threshold	145
22.2.3	dot1as pdelay-interval	145
22.2.4	dot1as announce-interval	145
22.2.5	dot1as sync-interval	145
22.2.6	dot1as announce-timeout	145
22.2.7	dot1as sync-timeout	146
22.2.8	dot1as pdelay-timeout	146
22.3	show	146
22.3.1	show dot1as	146
23	IEEE 802.1x (Dot1x - Port Based Network Access Control)	147
23.1	dot1x	147
23.1.1	dot1x dynamic-vlan	147
23.1.2	dot1x radius_vlan_assignment	147
23.1.3	dot1x radius-vlan-assignment	147
23.1.4	dot1x system-auth-control	147
23.1.5	dot1x monitor	147
23.1.6	dot1x mac-authentication-bypass format group-size	148
23.1.7	dot1x mac-authentication-bypass format group-separator	148
23.1.8	dot1x mac-authentication-bypass format letter-case	148
23.1.9	dot1x mac-authentication-bypass password	148
23.2	dot1x	148
23.2.1	dot1x guest-vlan	148
23.2.2	dot1x max-req	148
23.2.3	dot1x max-users	149
23.2.4	dot1x mac-auth-bypass	149
23.2.5	dot1x port-control	149
23.2.6	dot1x re-authentication	149
23.2.7	dot1x unauthenticated-vlan	149
23.2.8	dot1x timeout guest-vlan-period	149
23.2.9	dot1x timeout reauth-period	150
23.2.10	dot1x timeout quiet-period	150
23.2.11	dot1x timeout tx-period	150
23.2.12	dot1x timeout supp-timeout	150
23.2.13	dot1x timeout server-timeout	150
23.2.14	dot1x initialize	150
23.2.15	dot1x re-authenticate	150
23.3	show	151
23.3.1	show dot1x global	151
23.3.2	show dot1x auth-history	151
23.3.3	show dot1x detail	151
23.3.4	show dot1x summary	151
23.3.5	show dot1x clients	151
23.3.6	show dot1x statistics	151
23.4	clear	152
23.4.1	clear dot1x statistics port	152
23.4.2	clear dot1x statistics all	152
23.4.3	clear dot1x auth-history port	152
23.4.4	clear dot1x auth-history all	152
24	IEEE 802.3ad (Dot3ad - Link Aggregation)	153
24.1	link-aggregation	153
24.1.1	link-aggregation add	153
24.1.2	link-aggregation modify	153
24.1.3	link-aggregation delete	153
24.1.4	link-aggregation hashmode	154
24.2	lACP	154
24.2.1	lACP admin-key	154
24.2.2	lACP collector-max-delay	154

24.2.3	lacp lacpmode	154
24.2.4	lacp actor admin key	154
24.2.5	lacp actor admin state lacp-activity	154
24.2.6	lacp actor admin state lacp-timeout	155
24.2.7	lacp actor admin state aggregation	155
24.2.8	lacp actor admin port priority	155
24.2.9	lacp partner admin key	155
24.2.10	lacp partner admin state lacp-activity	155
24.2.11	lacp partner admin state lacp-timeout	155
24.2.12	lacp partner admin state aggregation	156
24.2.13	lacp partner admin port priority	156
24.2.14	lacp partner admin port id	156
24.2.15	lacp partner admin system-priority	156
24.2.16	lacp partner admin system-id	156
24.3	show	156
24.3.1	show link-aggregation global	156
24.3.2	show link-aggregation port	157
24.3.3	show link-aggregation statistics	157
24.3.4	show link-aggregation members	157
24.3.5	show lacp interface	157
24.3.6	show lacp mode	157
24.3.7	show lacp actor	157
24.3.8	show lacp partner operational	157
24.3.9	show lacp partner admin	157
25	Distance Vector Multicast Routing Protocol (DVMRP)	159
25.1	ip	159
25.1.1	ip dvmrp operation	159
25.1.2	ip dvmrp trapflag	159
25.1.3	ip dvmrp route-expire	159
25.2	ip	159
25.2.1	ip dvmrp operation	159
25.2.2	ip dvmrp metric	160
25.3	show	160
25.3.1	show ip dvmrp global	160
25.3.2	show ip dvmrp interface	160
25.3.3	show ip dvmrp neighbor	160
25.3.4	show ip dvmrp route	160
25.3.5	show ip dvmrp nexthop	160
25.3.6	show ip dvmrp prune	160
26	Ethernet IP	161
26.1	ethernet-ip	161
26.1.1	ethernet-ip operation	161
26.1.2	ethernet-ip vlan-id	161
26.1.3	ethernet-ip write-access	161
26.1.4	ethernet-ip interface	161
26.2	show	161
26.2.1	show ethernet-ip	162
26.3	copy	162
26.3.1	copy eds-ethernet-ip system remote	162
26.3.2	copy eds-ethernet-ip system envm	162
27	Filtering Database (FDB)	163
27.1	mac-filter	163
27.1.1	mac-filter	163
27.2	bridge	163
27.2.1	bridge aging-time	163
27.3	show	163
27.3.1	show mac-filter-table static	163
27.4	show	163
27.4.1	show bridge aging-time	163

27.5	show	164
27.5.1	show mac-addr-table	164
27.6	clear	164
27.6.1	clear mac-addr-table	164
28	GARP VLAN and Multicast Registration Protocol (GVRP and GMRP)	165
28.1	garp	165
28.1.1	garp gvrp operation	165
28.1.2	garp gmrp operation	165
28.1.3	garp gmrp forward-unknown	165
28.2	garp	165
28.2.1	garp interface join-time	165
28.2.2	garp interface leave-time	166
28.2.3	garp interface leave-all-time	166
28.2.4	garp gvrp operation	166
28.2.5	garp gmrp operation	166
28.2.6	garp gmrp forward-all-groups	166
28.3	show	166
28.3.1	show garp interface	167
28.3.2	show garp gvrp global	167
28.3.3	show garp gvrp interface	167
28.3.4	show garp gvrp statistics interface	167
28.3.5	show garp gmrp global	167
28.3.6	show garp gmrp interface	167
28.3.7	show garp gmrp statistics interface	167
28.4	show	167
28.4.1	show mac-filter-table gmrp	168
29	HiDiscovery	169
29.1	network	169
29.1.1	network hidiscovery operation	169
29.1.2	network hidiscovery mode	169
29.1.3	network hidiscovery blinking	169
29.1.4	network hidiscovery relay	169
29.1.5	network hidiscovery operation	169
29.1.6	network hidiscovery mode	170
29.1.7	network hidiscovery blinking	170
29.1.8	network hidiscovery relay	170
29.2	show	170
29.2.1	show network hidiscovery	170
30	HIPER-Ring	171
30.1	hiper-ring	171
30.1.1	hiper-ring operation	171
30.1.2	hiper-ring mode	171
30.1.3	hiper-ring primary-port	171
30.1.4	hiper-ring secondary-port	171
30.2	show	171
30.2.1	show hiper-ring global	171
31	High-availability Seamless Redundancy (HSR)	172
31.1	hsr	172
31.1.1	hsr operation	172
31.1.2	hsr instance	172
31.2	clear	173
31.2.1	clear hsr proxy-node-table	173
31.2.2	clear hsr node-table	173
31.2.3	clear hsr counters	173
31.3	show	173
31.3.1	show hsr global	173
31.3.2	show hsr instance	173

31.3.3	show hsr node-table	173
31.3.4	show hsr proxy-node-table	174
31.3.5	show hsr counters	174
32	Hypertext Transfer Protocol (HTTP)	175
32.1	http	175
32.1.1	http port	175
32.1.2	http server	175
32.2	show	175
32.2.1	show http	175
33	HTTP Secure (HTTPS)	176
33.1	https	176
33.1.1	https server	176
33.1.2	https port	176
33.1.3	https fingerprint-type	176
33.1.4	https certificate	176
33.2	copy	176
33.2.1	copy https-cert remote	176
33.2.2	copy https-cert envm	177
33.3	show	177
33.3.1	show https	177
34	Integrated Authentication Server (IAS)	178
34.1	ias-users	178
34.1.1	ias-users add	178
34.1.2	ias-users delete	178
34.1.3	ias-users enable	178
34.1.4	ias-users disable	178
34.1.5	ias-users password	178
34.2	show	178
34.2.1	show ias-users	178
35	IEC 61850 MMS Server	179
35.1	iec61850-mms	179
35.1.1	iec61850-mms operation	179
35.1.2	iec61850-mms write-access	179
35.1.3	iec61850-mms port	179
35.1.4	iec61850-mms max-sessions	179
35.1.5	iec61850-mms technical-key	179
35.2	show	180
35.2.1	show iec61850-mms	180
36	Internet Group Management Protocol (IGMP)	181
36.1	ip	181
36.1.1	ip igmp operation	181
36.2	ip	181
36.2.1	ip igmp operation	181
36.2.2	ip igmp version	181
36.2.3	ip igmp robustness	181
36.2.4	ip igmp querier query-interval	181
36.2.5	ip igmp querier last-member-interval	182
36.2.6	ip igmp querier max-response-time	182
36.3	show	182
36.3.1	show ip igmp global	182
36.3.2	show ip igmp interface	182
36.3.3	show ip igmp membership	182
36.3.4	show ip igmp groups	182
36.3.5	show ip igmp statistics	182
37	IGMP Proxy	183

37.1	ip	183
37.1.1	ip igmp-proxy interface	183
37.1.2	ip igmp-proxy report-interval	183
37.2	show	183
37.2.1	show ip igmp-proxy global	183
37.2.2	show ip igmp-proxy groups	183
37.2.3	show ip igmp-proxy source-list	183
38	IGMP Snooping	184
38.1	igmp-snooping	184
38.1.1	igmp-snooping mode	184
38.1.2	igmp-snooping querier mode	184
38.1.3	igmp-snooping querier query-interval	184
38.1.4	igmp-snooping querier timer-expiry	184
38.1.5	igmp-snooping querier version	184
38.1.6	igmp-snooping forward-unknown	184
38.2	igmp-snooping	185
38.2.1	igmp-snooping vlan-id	185
38.3	igmp-snooping	185
38.3.1	igmp-snooping mode	185
38.3.2	igmp-snooping fast-leave	186
38.3.3	igmp-snooping groupmembership-interval	186
38.3.4	igmp-snooping maxresponse	186
38.3.5	igmp-snooping mcrtrexpiretime	186
38.3.6	igmp-snooping static-query-port	186
38.4	show	186
38.4.1	show igmp-snooping global	187
38.4.2	show igmp-snooping interface	187
38.4.3	show igmp-snooping vlan	187
38.4.4	show igmp-snooping querier global	187
38.4.5	show igmp-snooping querier vlan	187
38.4.6	show igmp-snooping enhancements vlan	187
38.4.7	show igmp-snooping enhancements unknown-filtering	187
38.4.8	show igmp-snooping statistics global	187
38.4.9	show igmp-snooping statistics interface	187
38.5	show	188
38.5.1	show mac-filter-table igmp-snooping	188
38.6	clear	188
38.6.1	clear igmp-snooping	188
39	Interface	189
39.1	shutdown	189
39.1.1	shutdown	189
39.2	auto-negotiate	189
39.2.1	auto-negotiate speed	189
39.2.2	auto-negotiate duplex	189
39.2.3	auto-negotiate reset	190
39.2.4	auto-negotiate advertise	190
39.3	auto-power-down	190
39.3.1	auto-power-down	190
39.4	cable-crossing	190
39.4.1	cable-crossing	190
39.5	linktraps	190
39.5.1	linktraps	190
39.6	link-loss-alert	191
39.6.1	link-loss-alert operation	191
39.7	speed	191
39.7.1	speed	191
39.8	name	191
39.8.1	name	191

39.9	power-state	192
39.9.1	power-state	192
39.10	mac-filter	192
39.10.1	mac-filter	192
39.11	led-signaling	192
39.11.1	led-signaling operation	192
39.12	track	192
39.12.1	track if-status add	193
39.12.2	track if-status delete	193
39.13	show	193
39.13.1	show port	193
39.13.2	show auto-negotiation	193
39.14	show	193
39.14.1	show link-loss-alert	193
39.15	show	193
39.15.1	show led-signaling operation	194
40	Interface Statistics	195
40.1	utilization	195
40.1.1	utilization control-interval	195
40.1.2	utilization alarm-threshold lower	195
40.1.3	utilization alarm-threshold upper	195
40.1.4	utilization ingress control-interval	195
40.1.5	utilization ingress alarm-threshold lower	195
40.1.6	utilization ingress alarm-threshold upper	195
40.1.7	utilization egress control-interval	196
40.1.8	utilization egress alarm-threshold lower	196
40.1.9	utilization egress alarm-threshold upper	196
40.2	clear	196
40.2.1	clear port-statistics	196
40.3	show	196
40.3.1	show interface counters	196
40.3.2	show interface layout	196
40.3.3	show interface utilization	197
40.3.4	show interface statistics	197
40.3.5	show interface ether-stats	197
41	Intern	198
41.1	help	198
41.2	logout	198
41.3	history	198
41.4	vlan	198
41.4.1	vlan database	198
41.5	vlan-mode	198
41.5.1	vlan-mode	198
41.6	exit	199
41.7	end	199
41.8	serviceshell	199
41.8.1	serviceshell start	199
41.8.2	serviceshell debug	199
41.8.3	serviceshell boot fastboot	199
41.8.4	serviceshell boot test-mark	199
41.8.5	serviceshell boot test-reset-params	200
41.8.6	serviceshell boot test-print	200
41.8.7	serviceshell deactivate	200
41.9	serviceshell-f	200
41.9.1	serviceshell-f deactivate	200
41.10	traceroute	200

41.10.1tracert	200
41.11 tracert	201
41.11.1tracert source	201
41.12 reboot	201
41.12.1reboot after	201
41.13 ping	201
41.13.1ping count	201
41.14 ping	201
41.14.1ping source	202
41.15 show	202
41.15.1show reboot	202
41.15.2show serviceshell	202
42 Digital IO Module	203
42.1 digital-input	203
42.1.1 digital-input admin-state	203
42.1.2 digital-input refresh-interval	203
42.1.3 digital-input log-event io	203
42.1.4 digital-input log-event all	203
42.1.5 digital-input snmp-trap io	203
42.1.6 digital-input snmp-trap all	204
42.2 digital-output	204
42.2.1 digital-output admin-state	204
42.2.2 digital-output refresh-interval	204
42.2.3 digital-output retry-count	204
42.2.4 digital-output log-event io	204
42.2.5 digital-output log-event all	205
42.2.6 digital-output snmp-trap io	205
42.2.7 digital-output snmp-trap all	205
42.2.8 digital-output mirror io	205
42.3 show	206
42.3.1 show digital-input config	206
42.3.2 show digital-input io	206
42.3.3 show digital-output config	206
42.3.4 show digital-output io	206
43 Open Shortest Path First (OSPF)	207
43.1 ip	207
43.1.1 ip ospf area	207
43.1.2 ip ospf trapflags all	209
43.1.3 ip ospf operation	209
43.1.4 ip ospf 1583compatability	209
43.1.5 ip ospf default-metric	209
43.1.6 ip ospf router-id	210
43.1.7 ip ospf external-lsdb-limit	210
43.1.8 ip ospf exit-overflow	210
43.1.9 ip ospf maximum-path	210
43.1.10ip ospf spf-delay	210
43.1.11ip ospf spf-holdtime	210
43.1.12ip ospf auto-cost	210
43.1.13ip ospf distance intra	211
43.1.14ip ospf distance inter	211
43.1.15ip ospf distance external	211
43.1.16ip ospf re-distribute	211
43.1.17ip ospf distribute-list	211
43.1.18ip ospf default-info originate	212
43.2 ip	212
43.2.1 ip ospf operation	212
43.2.2 ip ospf area-id	212
43.2.3 ip ospf link-type	213
43.2.4 ip ospf priority	213
43.2.5 ip ospf transmit-delay	213
43.2.6 ip ospf retransmit-interval	213
43.2.7 ip ospf hello-interval	213

43.2.8	ip ospf dead-interval	213
43.2.9	ip ospf cost	214
43.2.10	ip ospf mtu-ignore	214
43.2.11	ip ospf authentication type	214
43.2.12	ip ospf authentication key	214
43.2.13	ip ospf authentication key-id	214
43.2.14	ip ospf fast-hello	214
43.3	show	215
43.3.1	show ip ospf global	215
43.3.2	show ip ospf area	215
43.3.3	show ip ospf stub	215
43.3.4	show ip ospf database internal	215
43.3.5	show ip ospf database external	215
43.3.6	show ip ospf range	215
43.3.7	show ip ospf interface	215
43.3.8	show ip ospf virtual-link	215
43.3.9	show ip ospf virtual-neighbor	216
43.3.10	show ip ospf neighbor	216
43.3.11	show ip ospf statistics	216
43.3.12	show ip ospf re-distribute	216
43.3.13	show ip ospf nssa	216
43.3.14	show ip ospf route	216
44	Routing Information Protocol (RIP)	217
44.1	ip	217
44.1.1	ip rip operation	217
44.1.2	ip rip auto-summary	217
44.1.3	ip rip default-info originate	217
44.1.4	ip rip default-metric	217
44.1.5	ip rip distance	218
44.1.6	ip rip host-route-accept	218
44.1.7	ip rip distribute-list	218
44.1.8	ip rip re-distribute	218
44.1.9	ip rip split-horizon	219
44.1.10	ip rip update-timer	219
44.2	ip	219
44.2.1	ip rip authentication type	219
44.2.2	ip rip authentication key	219
44.2.3	ip rip authentication key-id	220
44.2.4	ip rip operation	220
44.2.5	ip rip send-version	220
44.2.6	ip rip receive-version	220
44.3	show	220
44.3.1	show ip rip global	220
44.3.2	show ip rip interface	220
44.3.3	show ip rip statistics global	221
44.3.4	show ip rip statistics interface	221
44.3.5	show ip rip re-distribute	221
45	Virtual Router Redundancy Protocol (VRRP)	222
45.1	ip	222
45.1.1	ip vrrp operation	222
45.1.2	ip vrrp trap auth-failure	222
45.1.3	ip vrrp trap new-master	222
45.1.4	ip vrrp domain	222
45.2	ip	223
45.2.1	ip vrrp add	223
45.2.2	ip vrrp modify	223
45.2.3	ip vrrp delete	224
45.2.4	ip vrrp enable	224
45.2.5	ip vrrp disable	224
45.2.6	ip vrrp virtual-address add	224
45.2.7	ip vrrp virtual-address delete	224
45.2.8	ip vrrp track add	224
45.2.9	ip vrrp track modify	225
45.2.10	ip vrrp track delete	225

45.3	show	225
45.3.1	show ip vrrp interface	225
45.3.2	show ip vrrp global	225
45.3.3	show ip vrrp domains	225
46	Address Resolution Protocol (IP ARP)	226
46.1	ip	226
46.1.1	ip arp add	226
46.1.2	ip arp delete	226
46.1.3	ip arp enable	226
46.1.4	ip arp disable	226
46.1.5	ip arp timeout	226
46.1.6	ip arp response-time	226
46.1.7	ip arp retries	226
46.1.8	ip arp dynamic-renew	227
46.1.9	ip arp selective-learning	227
46.2	show	227
46.2.1	show ip arp info	227
46.2.2	show ip arp table	227
46.2.3	show ip arp static	227
46.2.4	show ip arp entry	227
46.3	clear	228
46.3.1	clear ip arp-cache	228
47	IP UDP Helper (IP Helper)	229
47.1	ip	229
47.1.1	ip udp-helper operation	229
47.1.2	ip udp-helper server add	229
47.1.3	ip udp-helper server delete	229
47.1.4	ip udp-helper server enable	230
47.1.5	ip udp-helper server disable	230
47.1.6	ip udp-helper maxhopcount	230
47.1.7	ip udp-helper minwaittime	230
47.1.8	ip udp-helper cidoptmode	231
47.2	ip	231
47.2.1	ip udp-helper server add	231
47.2.2	ip udp-helper server delete	231
47.2.3	ip udp-helper server enable	232
47.2.4	ip udp-helper server disable	232
47.3	show	232
47.3.1	show ip udp-helper status	232
47.3.2	show ip udp-helper global	232
47.3.3	show ip udp-helper interface	233
47.3.4	show ip udp-helper statistics	233
47.4	clear	233
47.4.1	clear ip udp-helper	233
48	IP Source Guard (IPSG)	234
48.1	ip	234
48.1.1	ip source-guard binding add	234
48.1.2	ip source-guard binding delete all	234
48.1.3	ip source-guard binding delete interface	234
48.1.4	ip source-guard binding delete index	234
48.1.5	ip source-guard binding mode	234
48.2	clear	235
48.2.1	clear ip source-guard bindings	235
48.3	ip	235
48.3.1	ip source-guard mode	235
48.3.2	ip source-guard verify-mac	235
48.4	show	235
48.4.1	show ip source-guard interfaces	235
48.4.2	show ip source-guard bindings	235

49	IP Subnet VLAN	236
49.1	vlan	236
49.1.1	vlan association subnet	236
49.2	show	236
49.2.1	show vlan association subnet	236
50	Internet Protocol Version 4 (IPv4)	237
50.1	network	237
50.1.1	network protocol	237
50.1.2	network parms	237
50.1.3	network dhcp config-load	237
50.2	clear	237
50.2.1	clear arp-table-switch	237
50.3	show	237
50.3.1	show network parms	237
50.3.2	show network services	238
50.3.3	show network dhcp	238
50.4	show	238
50.4.1	show arp	238
51	Internet Protocol Version 6 (IPv6)	239
51.1	network	239
51.1.1	network ipv6 gateway	239
51.1.2	network ipv6 operation	239
51.1.3	network ipv6 address delete	239
51.1.4	network ipv6 address enable	239
51.1.5	network ipv6 address disable	239
51.1.6	network ipv6 address modify	239
51.1.7	network ipv6 address add	240
51.1.8	network ipv6 protocol	240
51.1.9	network ipv6 dad-transmits	240
51.2	show	240
51.2.1	show network ipv6 neighbors	240
51.2.2	show network ipv6 address all	240
51.2.3	show network ipv6 address autoconf	240
51.2.4	show network ipv6 address dhcpv6	241
51.2.5	show network ipv6 global	241
52	ICMP Router Discovery Protocol (IRDP)	242
52.1	ip	242
52.1.1	ip irdp operation	242
52.1.2	ip irdp address	242
52.1.3	ip irdp holdtime	242
52.1.4	ip irdp maxadvertinterval	242
52.1.5	ip irdp minadvertinterval	242
52.1.6	ip irdp preference	242
52.2	show	243
52.2.1	show ip irdp	243
53	Inter Range Instrumentation Group IRIG-B	244
53.1	irig-b	244
53.1.1	irig-b operation	244
53.1.2	irig-b mode	244
53.1.3	irig-b pps	244
53.1.4	irig-b time	244
53.2	show	244
53.2.1	show irig-b	245
54	Ring Coupling	246

54.1	ring-coupling	246
54.1.1	ring-coupling add	246
54.1.2	ring-coupling delete	246
54.1.3	ring-coupling modify	246
54.1.4	ring-coupling enable	247
54.1.5	ring-coupling disable	247
54.2	show	247
54.2.1	show ring-coupling global	247
54.2.2	show ring-coupling status	247
55	License Manager	248
55.1	license	248
55.1.1	license level	248
55.1.2	license package	248
55.2	show	248
55.2.1	show license global	248
55.2.2	show license package	248
56	Link Backup	249
56.1	link-backup	249
56.1.1	link-backup operation	249
56.2	link-backup	249
56.2.1	link-backup add	249
56.2.2	link-backup delete	249
56.2.3	link-backup modify	249
56.3	show	250
56.3.1	show link-backup operation	250
56.3.2	show link-backup pairs	250
57	Link Layer Discovery Protocol (LLDP)	251
57.1	lldp	251
57.1.1	lldp operation	251
57.1.2	lldp config chassis admin-state	251
57.1.3	lldp config chassis notification-interval	251
57.1.4	lldp config chassis re-init-delay	251
57.1.5	lldp config chassis tx-delay	251
57.1.6	lldp config chassis tx-hold-multiplier	251
57.1.7	lldp config chassis tx-interval	252
57.2	show	252
57.2.1	show lldp global	252
57.2.2	show lldp port	252
57.2.3	show lldp remote-data	252
57.3	lldp	252
57.3.1	lldp admin-state	252
57.3.2	lldp fdb-mode	252
57.3.3	lldp max-neighbors	253
57.3.4	lldp notification	253
57.3.5	lldp tlv inline-power	253
57.3.6	lldp tlv link-aggregation	253
57.3.7	lldp tlv mac-phy-config-state	253
57.3.8	lldp tlv max-frame-size	254
57.3.9	lldp tlv mgmt-addr	254
57.3.10	lldp tlv port-desc	254
57.3.11	lldp tlv port-vlan	254
57.3.12	lldp tlv protocol	255
57.3.13	lldp tlv sys-cap	255
57.3.14	lldp tlv sys-desc	255
57.3.15	lldp tlv sys-name	255
57.3.16	lldp tlv vlan-name	255
57.3.17	lldp tlv protocol-based-vlan	256
57.3.18	lldp tlv igmp	256
57.3.19	lldp tlv portsec	256
57.3.20	lldp tlv ptp	256

57.3.21	lldp tlv pno	256
57.3.22	lldp tlv pno-alias	257
57.3.23	lldp tlv pno-mrp	257
58	Media Endpoint Discovery LLDP-MED	258
58.1	lldp	258
58.1.1	lldp med confignotification	258
58.1.2	lldp med transmit-tlv capabilities	258
58.1.3	lldp med transmit-tlv network-policy	258
58.2	lldp	258
58.2.1	lldp med faststartrepeatcount	258
58.3	show	259
58.3.1	show lldp med global	259
58.3.2	show lldp med interface	259
58.3.3	show lldp med local-device	259
58.3.4	show lldp med remote-device detail	259
58.3.5	show lldp med remote-device summary	259
59	Logging	260
59.1	logging	260
59.1.1	logging audit-trail	260
59.1.2	logging buffered severity	260
59.1.3	logging host add	260
59.1.4	logging host delete	261
59.1.5	logging host enable	261
59.1.6	logging host disable	261
59.1.7	logging host modify	261
59.1.8	logging syslog operation	262
59.1.9	logging current-console operation	262
59.1.10	logging current-console severity	262
59.1.11	logging console operation	263
59.1.12	logging console severity	263
59.1.13	logging persistent operation	263
59.1.14	logging persistent numfiles	264
59.1.15	logging persistent filesize	264
59.1.16	logging persistent severity-level	264
59.1.17	logging email operation	264
59.1.18	logging email from-addr	264
59.1.19	logging email duration	265
59.1.20	logging email severity urgent	265
59.1.21	logging email severity non-urgent	265
59.1.22	logging email to-addr add	265
59.1.23	logging email to-addr delete	266
59.1.24	logging email to-addr modify	266
59.1.25	logging email to-addr enable	266
59.1.26	logging email to-addr disable	266
59.1.27	logging email mail-server add	266
59.1.28	logging email mail-server delete	267
59.1.29	logging email mail-server modify	267
59.1.30	logging email subject add	267
59.1.31	logging email subject delete	267
59.1.32	logging email subject modify	268
59.1.33	logging email test msgtype	268
59.2	show	268
59.2.1	show logging buffered	268
59.2.2	show logging traplogs	268
59.2.3	show logging console	268
59.2.4	show logging persistent	268
59.2.5	show logging syslog	268
59.2.6	show logging host	269
59.2.7	show logging email statistics	269
59.2.8	show logging email global	269
59.2.9	show logging email to-addr	269
59.2.10	show logging email subject	269
59.2.11	show logging email mail-server	269
59.3	copy	269

59.3.1	copy eventlog buffered envm	269
59.3.2	copy eventlog buffered remote	269
59.3.3	copy eventlog persistent	270
59.3.4	copy traplog system envm	270
59.3.5	copy traplog system remote	270
59.3.6	copy audittrail system envm	270
59.3.7	copy audittrail system remote	270
59.3.8	copy mailcacert remote	271
59.3.9	copy mailcacert envm	271
59.3.10	copy syslogcacert remote	271
59.3.11	copy syslogcacert envm	271
59.4	clear	271
59.4.1	clear logging buffered	271
59.4.2	clear logging persistent	271
59.4.3	clear logging email statistics	272
59.4.4	clear eventlog	272
60	Loop Protection	273
60.1	loop-protection	273
60.1.1	loop-protection operation	273
60.1.2	loop-protection tx-interval	273
60.1.3	loop-protection rx-threshold	273
60.2	loop-protection	273
60.2.1	loop-protection operation	273
60.2.2	loop-protection mode	273
60.2.3	loop-protection action	274
60.2.4	loop-protection vlan	274
60.2.5	loop-protection clear-statistics	274
60.3	show	274
60.3.1	show loop-protection global	274
60.3.2	show loop-protection interface	274
61	Parallel Redundancy Protocol (PRP)	275
61.1	prp	275
61.1.1	prp operation	275
61.1.2	prp instance	275
61.2	show	275
61.2.1	show prp global	275
61.2.2	show prp instance	276
61.2.3	show prp node-table	276
61.2.4	show prp proxy-node-table	276
61.2.5	show prp counters	276
61.3	clear	276
61.3.1	clear prp proxy-node-table	276
61.3.2	clear prp node-table	276
61.3.3	clear prp counters	276
62	MAC Notification	277
62.1	mac	277
62.1.1	mac notification operation	277
62.1.2	mac notification interval	277
62.2	mac	277
62.2.1	mac notification operation	277
62.2.2	mac notification interval	277
62.3	mac	277
62.3.1	mac notification operation	278
62.4	mac	278
62.4.1	mac notification operation	278
62.5	show	278
62.5.1	show mac notification global	278
62.5.2	show mac notification interface	278

63	MAC VLAN	279
63.1	vlan	279
63.1.1	vlan association mac	279
63.2	show	279
63.2.1	show vlan association mac	279
64	Management Access	280
64.1	network	280
64.1.1	network management access web timeout	280
64.1.2	network management access add	280
64.1.3	network management access delete	280
64.1.4	network management access modify	281
64.1.5	network management access operation	281
64.1.6	network management access status	281
64.2	show	282
64.2.1	show network management access global	282
64.2.2	show network management access rules	282
64.2.3	show network management access counters	282
64.3	clear	282
64.3.1	clear management-counters	282
65	Management Address	283
65.1	network	283
65.1.1	network management mac	283
65.1.2	network management port	283
65.2	show	283
65.2.1	show network management mac	283
65.2.2	show network management port	283
66	Modbus	284
66.1	modbus-tcp	284
66.1.1	modbus-tcp operation	284
66.1.2	modbus-tcp write-access	284
66.1.3	modbus-tcp port	284
66.1.4	modbus-tcp max-sessions	284
66.2	show	284
66.2.1	show modbus-tcp	284
67	Multicast Routing	285
67.1	ip	285
67.1.1	ip mcast staticroute add	285
67.1.2	ip mcast staticroute modify	285
67.1.3	ip mcast staticroute delete	286
67.1.4	ip mcast operation	287
67.1.5	ip mcast software-dscp-value	287
67.2	ip	287
67.2.1	ip mcast ttl-threshold	288
67.2.2	ip mcast boundary	288
67.3	show	288
67.3.1	show ip mcast global	288
67.3.2	show ip mcast boundary	288
67.3.3	show ip mcast interface	288
67.3.4	show ip mcast mroute static	288
67.3.5	show ip mcast mroute detail	288
67.3.6	show ip mcast mroute summary	289
68	Media Redundancy Protocol (MRP)	290
68.1	mrp	290
68.1.1	mrp domain modify advanced-mode	290

68.1.2 mrp domain modify manager-priority	290
68.1.3 mrp domain modify mode	290
68.1.4 mrp domain modify name	290
68.1.5 mrp domain modify operation	290
68.1.6 mrp domain modify port primary	290
68.1.7 mrp domain modify port secondary	291
68.1.8 mrp domain modify recovery-delay	291
68.1.9 mrp domain modify round-trip-delay	291
68.1.10 mrp domain modify vlan	291
68.1.11 mrp domain add default-domain	291
68.1.12 mrp domain add domain-id	291
68.1.13 mrp domain delete	291
68.1.14 mrp operation	292
68.2 show	292
68.2.1 show mrp	292
69 MRP IEEE	293
69.1 mrp-ieee	293
69.1.1 mrp-ieee global join-time	293
69.1.2 mrp-ieee global leave-time	293
69.1.3 mrp-ieee global leave-all-time	293
69.2 show	293
69.2.1 show mrp-ieee global interface	293
70 MRP IEEE MMRP	294
70.1 mrp-ieee	294
70.1.1 mrp-ieee mmrp vlan-id	294
70.2 show	294
70.2.1 show mrp-ieee mmrp global	294
70.2.2 show mrp-ieee mmrp interface	294
70.2.3 show mrp-ieee mmrp statistics global	294
70.2.4 show mrp-ieee mmrp statistics interface	294
70.2.5 show mrp-ieee mmrp service-requirement forward-all vlan	295
70.2.6 show mrp-ieee mmrp service-requirement forbidden vlan	295
70.3 mrp-ieee	295
70.3.1 mrp-ieee mmrp operation	295
70.3.2 mrp-ieee mmrp periodic-machine	295
70.4 clear	295
70.4.1 clear mrp-ieee mmrp	295
70.5 mrp-ieee	296
70.5.1 mrp-ieee mmrp operation	296
70.5.2 mrp-ieee mmrp restrict-register	296
70.6 show	296
70.6.1 show mac-filter-table mmrp	296
71 MRP IEEE MSRP	297
71.1 mrp-ieee	297
71.1.1 mrp-ieee msrp operation	297
71.1.2 mrp-ieee msrp boundary-propagate	297
71.1.3 mrp-ieee msrp talker-pruning	297
71.1.4 mrp-ieee msrp max-fan-in-ports	297
71.2 show	297
71.2.1 show mrp-ieee msrp statistics global	298
71.2.2 show mrp-ieee msrp statistics interface	298
71.3 clear	298
71.3.1 clear mrp-ieee msrp	298
72 MRP IEEE MVRP	299
72.1 mrp-ieee	299
72.1.1 mrp-ieee mvrp operation	299
72.1.2 mrp-ieee mvrp periodic-machine	299

72.2	mrp-ieee	299
72.2.1	mrp-ieee mvrp operation	299
72.2.2	mrp-ieee mvrp restrict-register	299
72.3	show	300
72.3.1	show mrp-ieee mvrp global	300
72.3.2	show mrp-ieee mvrp interface	300
72.3.3	show mrp-ieee mvrp statistics global	300
72.3.4	show mrp-ieee mvrp statistics interface	300
72.4	clear	300
72.4.1	clear mrp-ieee mvrp	300
73	Network Address Translation (NAT)	301
73.1	nat	301
73.1.1	nat dnat commit	301
73.1.2	nat dnat add	301
73.1.3	nat dnat modify	301
73.1.4	nat dnat delete	302
73.1.5	nat dnat logtrap	302
73.1.6	nat dnat state	302
73.1.7	nat dnat if add	303
73.1.8	nat dnat if delete	303
73.1.9	nat 1to1nat commit	303
73.1.10	nat 1to1nat add	303
73.1.11	nat 1to1nat modify	303
73.1.12	nat 1to1nat delete	304
73.1.13	nat 1to1nat logtrap	304
73.1.14	nat 1to1nat state	304
73.1.15	nat 1to1nat enable	304
73.1.16	nat 1to1nat disable	304
73.1.17	nat alg	305
73.1.18	nat interface	305
73.1.19	nat masq commit	305
73.1.20	nat masq add	305
73.1.21	nat masq modify	305
73.1.22	nat masq delete	306
73.1.23	nat masq logtrap	306
73.1.24	nat masq ipsec-exempt	306
73.1.25	nat masq state	306
73.1.26	nat masq if add	306
73.1.27	nat masq if delete	307
73.1.28	nat doublenat commit	307
73.1.29	nat doublenat add	307
73.1.30	nat doublenat modify	307
73.1.31	nat doublenat delete	307
73.1.32	nat doublenat logtrap	307
73.1.33	nat doublenat state	308
73.1.34	nat doublenat if add	308
73.1.35	nat doublenat if delete	308
73.2	show	308
73.2.1	show nat dnat global	308
73.2.2	show nat dnat rules	308
73.2.3	show nat dnat if	308
73.2.4	show nat dnat logtrap	309
73.2.5	show nat masq global	309
73.2.6	show nat masq rules	309
73.2.7	show nat masq logtrap	309
73.2.8	show nat masq if	309
73.2.9	show nat 1to1nat global	309
73.2.10	show nat 1to1nat rules	309
73.2.11	show nat 1to1nat logtrap	309
73.2.12	show nat doublenat global	310
73.2.13	show nat doublenat rules	310
73.2.14	show nat doublenat logtrap	310
73.2.15	show nat doublenat if	310
74	Network Time Protocol (NTP)	311

74.1	ntp	311
74.1.1	ntp client operation	311
74.1.2	ntp client operating-mode	311
74.1.3	ntp server operation	311
74.1.4	ntp server operating-mode	311
74.1.5	ntp server localclock-stratum	311
74.1.6	ntp peers add	311
74.1.7	ntp peers delete	312
74.2	show	312
74.2.1	show ntp client-status	312
74.2.2	show ntp server-status	312
75	OPC/UA Server (IEC62541)	313
75.1	opc-ua	313
75.1.1	opc-ua operation	313
75.1.2	opc-ua port	313
75.1.3	opc-ua sessions	313
75.1.4	opc-ua security-policy	313
75.1.5	opc-ua users add	313
75.1.6	opc-ua users delete	313
75.1.7	opc-ua users enable	314
75.1.8	opc-ua users disable	314
75.1.9	opc-ua users modify	314
75.2	show	314
75.2.1	show opc-ua global	314
75.2.2	show opc-ua users	314
76	Out-of-band Management	315
76.1	network	315
76.1.1	network out-of-band operation	315
76.1.2	network out-of-band protocol	315
76.1.3	network out-of-band parms	315
76.1.4	network usb operation	315
76.1.5	network usb parms	315
76.2	show	316
76.2.1	show network out-of-band	316
76.2.2	show network usb	316
77	Packet Filter	317
77.1	packet-filter	317
77.1.1	packet-filter l3 commit	317
77.1.2	packet-filter l3 defaultpolicy	317
77.1.3	packet-filter l3 checksum-validation	317
77.1.4	packet-filter l3 addrule	317
77.1.5	packet-filter l3 modifyrule	318
77.1.6	packet-filter l3 delrule	319
77.1.7	packet-filter l3 enablerule	319
77.1.8	packet-filter l3 disablerule	319
77.1.9	packet-filter l3 logmode	319
77.1.10	packet-filter l3 addif	319
77.1.11	packet-filter l3 delif	319
77.1.12	packet-filter l3 enableif	320
77.1.13	packet-filter l3 disableif	320
77.2	clear	320
77.2.1	clear fw-state-table	320
77.3	show	320
77.3.1	show packet-filter l3 global	320
77.3.2	show packet-filter l3 maxrules	320
77.3.3	show packet-filter l3 defaultpolicy	321
77.3.4	show packet-filter l3 ruletable	321
77.3.5	show packet-filter l3 iftable	321
77.3.6	show packet-filter l3 pending	321

78	Private VLAN	322
78.1	private-vlan	322
78.1.1	private-vlan vlan-id	322
78.1.2	private-vlan add associate primary	322
78.1.3	private-vlan delete associate primary	322
78.2	switchport	322
78.2.1	switchport mode private-vlan	322
78.2.2	switchport private-vlan add host-assoc primary	322
78.2.3	switchport private-vlan add promiscuous-assoc primary	323
78.2.4	switchport private-vlan delete host-assoc primary	323
78.2.5	switchport private-vlan delete promiscuous-assoc primary	323
78.3	show	323
78.3.1	show vlan private-vlan	323
79	Protocol Based VLAN	324
79.1	vlan	324
79.1.1	vlan protocol group add	324
79.1.2	vlan protocol group modify	324
79.1.3	vlan protocol group delete	324
79.2	vlan	324
79.2.1	vlan protocol group add	325
79.2.2	vlan protocol group delete	325
79.3	show	325
79.3.1	show vlan protocol	325
80	Protocol Independent Multicast (PIM)	326
80.1	ip	326
80.1.1	ip pim dense operation	326
80.1.2	ip pim dense holdtimes	326
80.1.3	ip pim sparse operation	326
80.1.4	ip pim sparse ssm add	326
80.1.5	ip pim sparse ssm enable	327
80.1.6	ip pim sparse ssm disable	328
80.1.7	ip pim sparse ssm delete	329
80.1.8	ip pim sparse rp-address add	330
80.1.9	ip pim sparse rp-address modify	331
80.1.10	ip pim sparse rp-address delete	332
80.1.11	ip pim sparse rp-address enable	333
80.1.12	ip pim sparse rp-address disable	334
80.1.13	ip pim sparse rp-candidate add	335
80.1.14	ip pim sparse rp-candidate delete	336
80.1.15	ip pim sparse rp-candidate enable	337
80.1.16	ip pim sparse rp-candidate disable	338
80.1.17	ip pim sparse bsr-candidate add	339
80.1.18	ip pim sparse bsr-candidate modify	339
80.1.19	ip pim sparse bsr-candidate delete	340
80.1.20	ip pim sparse bsr-candidate enable	340
80.1.21	ip pim sparse bsr-candidate disable	340
80.1.22	ip pim trapflag	340
80.2	ip	340
80.2.1	ip pim operation	340
80.2.2	ip pim hello-interval	341
80.2.3	ip pim sparse bsr-border	341
80.2.4	ip pim sparse dr-priority	341
80.2.5	ip pim sparse join-prune-interval	341
80.3	show	341
80.3.1	show ip pim global	341
80.3.2	show ip pim interface	341
80.3.3	show ip pim neighbor	341
80.3.4	show ip pim rp static	342
80.3.5	show ip pim rp mapping	342
80.3.6	show ip pim rp candidate	342
80.3.7	show ip pim bsr candidate	342

80.3.8	show ip pim bsr elected	342
80.3.9	show ip pim ssm	342
80.3.10	show ip pim rp-hash	342
81	Power Over Ethernet (PoE)	343
81.1	inlinepower	343
81.1.1	inlinepower operation	343
81.1.2	inlinepower slot	343
81.1.3	inlinepower threshold	343
81.1.4	inlinepower trap	343
81.2	inlinepower	344
81.2.1	inlinepower allowed-classes add	344
81.2.2	inlinepower allowed-classes delete	344
81.2.3	inlinepower auto-shutdown-end	344
81.2.4	inlinepower auto-shutdown-start	344
81.2.5	inlinepower auto-shutdown-timer	344
81.2.6	inlinepower operation	344
81.2.7	inlinepower name	345
81.2.8	inlinepower priority	345
81.2.9	inlinepower fast-startup	345
81.2.10	inlinepower power-limit	345
81.3	show	345
81.3.1	show inlinepower global	345
81.3.2	show inlinepower port	346
81.3.3	show inlinepower slot	346
82	Port Monitor	347
82.1	port-monitor	347
82.1.1	port-monitor operation	347
82.2	port-monitor	347
82.2.1	port-monitor condition crc-fragments interval	347
82.2.2	port-monitor condition crc-fragments count	347
82.2.3	port-monitor condition crc-fragments mode	347
82.2.4	port-monitor condition link-flap interval	347
82.2.5	port-monitor condition link-flap count	348
82.2.6	port-monitor condition link-flap mode	348
82.2.7	port-monitor condition duplex-mismatch mode	348
82.2.8	port-monitor condition overload-detection traffic-type	348
82.2.9	port-monitor condition overload-detection unit	348
82.2.10	port-monitor condition overload-detection upper-threshold	348
82.2.11	port-monitor condition overload-detection lower-threshold	349
82.2.12	port-monitor condition overload-detection polling-interval	349
82.2.13	port-monitor condition overload-detection mode	349
82.2.14	port-monitor condition speed-duplex mode	349
82.2.15	port-monitor condition speed-duplex speed	349
82.2.16	port-monitor condition speed-duplex clear	349
82.2.17	port-monitor action	350
82.2.18	port-monitor reset	350
82.3	show	350
82.3.1	show port-monitor operation	350
82.3.2	show port-monitor brief	350
82.3.3	show port-monitor overload-detection counters	350
82.3.4	show port-monitor overload-detection port	350
82.3.5	show port-monitor speed-duplex	350
82.3.6	show port-monitor port	351
82.3.7	show port-monitor link-flap	351
82.3.8	show port-monitor crc-fragments	351
83	Port Security	352
83.1	port-security	352
83.1.1	port-security operation	352
83.1.2	port-security mode	352
83.2	port-security	352
83.2.1	port-security operation	352

83.2.2	port-security max-dynamic	352
83.2.3	port-security max-static	353
83.2.4	port-security mac-address add	353
83.2.5	port-security mac-address move	353
83.2.6	port-security mac-address delete	353
83.2.7	port-security ip-address add	353
83.2.8	port-security ip-address delete	353
83.2.9	port-security violation-traps	353
83.3	show	354
83.3.1	show port-security global	354
83.3.2	show port-security interface	354
83.3.3	show port-security dynamic	354
83.3.4	show port-security static	354
83.3.5	show port-security violation	354
84	Profinet IO	355
84.1	profinet	355
84.1.1	profinet operation	355
84.1.2	profinet name-of-station	355
84.2	profinet	355
84.2.1	profinet dcp-mode	355
84.3	copy	355
84.3.1	copy gsdml-profinet system remote	356
84.3.2	copy gsdml-profinet system envm	356
84.4	show	356
84.4.1	show profinet global	356
84.4.2	show profinet port	356
85	Precision Time Protocol (PTP)	357
85.1	ptp	357
85.1.1	ptp operation	357
85.1.2	ptp clock-mode	357
85.1.3	ptp sync-lower-bound	357
85.1.4	ptp sync-upper-bound	357
85.1.5	ptp management	357
85.1.6	ptp v2-transparent-clock syntonization	358
85.1.7	ptp v2-transparent-clock network-protocol	358
85.1.8	ptp v2-transparent-clock multi-domain	358
85.1.9	ptp v2-transparent-clock sync-local-clock	358
85.1.10	ptp v2-transparent-clock delay-mechanism	358
85.1.11	ptp v2-transparent-clock primary-domain	358
85.1.12	ptp v2-transparent-clock vlan	359
85.1.13	ptp v2-transparent-clock vlan-priority	359
85.1.14	ptp v2-boundary-clock domain	359
85.1.15	ptp v2-boundary-clock priority1	359
85.1.16	ptp v2-boundary-clock priority2	359
85.1.17	ptp v2-boundary-clock utc-offset	359
85.1.18	ptp v2-boundary-clock utc-offset-valid	359
85.2	ptp	360
85.2.1	ptp v2-transparent-clock operation	360
85.2.2	ptp v2-transparent-clock asymmetry	360
85.2.3	ptp v2-transparent-clock pdelay-interval	360
85.2.4	ptp v2-boundary-clock operation	360
85.2.5	ptp v2-boundary-clock pdelay-interval	361
85.2.6	ptp v2-boundary-clock announce-interval	361
85.2.7	ptp v2-boundary-clock sync-interval	361
85.2.8	ptp v2-boundary-clock announce-timeout	361
85.2.9	ptp v2-boundary-clock asymmetry	361
85.2.10	ptp v2-boundary-clock v1-compatibility-mode	361
85.2.11	ptp v2-boundary-clock delay-mechanism	362
85.2.12	ptp v2-boundary-clock network-protocol	362
85.2.13	ptp v2-boundary-clock vlan-priority	362
85.2.14	ptp v2-boundary-clock vlan	362
85.3	show	362
85.3.1	show ptp	362

86	Password Management	363
86.1	passwords	363
86.1.1	passwords min-length	363
86.1.2	passwords max-login-attempts	363
86.1.3	passwords min-uppercase-chars	363
86.1.4	passwords min-lowercase-chars	363
86.1.5	passwords min-numeric-chars	363
86.1.6	passwords min-special-chars	363
86.1.7	passwords login-attempt-period	363
86.2	show	364
86.2.1	show passwords	364
87	Radius	365
87.1	authorization	365
87.1.1	authorization network radius	365
87.2	radius	365
87.2.1	radius accounting mode	365
87.2.2	radius server attribute 4	365
87.2.3	radius server acct add	365
87.2.4	radius server acct delete	366
87.2.5	radius server acct modify	366
87.2.6	radius server auth add	366
87.2.7	radius server auth delete	366
87.2.8	radius server auth modify	366
87.2.9	radius server retransmit	367
87.2.10	radius server timeout	367
87.2.11	radius source-interface	367
87.3	show	367
87.3.1	show radius global	367
87.3.2	show radius auth servers	367
87.3.3	show radius auth statistics	367
87.3.4	show radius acct statistics	368
87.3.5	show radius acct servers	368
87.4	clear	368
87.4.1	clear radius	368
88	Redundant Coupling Protocol (RCP)	369
88.1	redundant-coupling	369
88.1.1	redundant-coupling operation	369
88.1.2	redundant-coupling timeout	369
88.1.3	redundant-coupling role	369
88.1.4	redundant-coupling port primary inner	369
88.1.5	redundant-coupling port primary outer	369
88.1.6	redundant-coupling port secondary inner	369
88.1.7	redundant-coupling port secondary outer	370
88.2	show	370
88.2.1	show redundant-coupling global	370
88.2.2	show redundant-coupling status	370
88.2.3	show redundant-coupling partner	370
89	Remote Authentication	371
89.1	ldap	371
89.1.1	ldap operation	371
89.1.2	ldap cache-timeout	371
89.1.3	ldap flush-user-cache	371
89.1.4	ldap role-policy	371
89.1.5	ldap basedn	371
89.1.6	ldap search-attr	371
89.1.7	ldap bind-user	372
89.1.8	ldap bind-passwd	372
89.1.9	ldap default-domain	372
89.1.10	ldap client server add	372

89.1.11	ldap client server delete	372
89.1.12	ldap client server enable	372
89.1.13	ldap client server disable	372
89.1.14	ldap client server modify	373
89.1.15	ldap mapping add	373
89.1.16	ldap mapping delete	373
89.1.17	ldap mapping enable	373
89.1.18	ldap mapping disable	373
89.2	show	374
89.2.1	show ldap global	374
89.2.2	show ldap client server	374
89.2.3	show ldap mapping	374
89.3	copy	374
89.3.1	copy ldapcert remote	374
89.3.2	copy ldapcert envm	374
90	Remote Monitoring (RMON)	375
90.1	rmon-alarm	375
90.1.1	rmon-alarm add	375
90.1.2	rmon-alarm enable	375
90.1.3	rmon-alarm disable	375
90.1.4	rmon-alarm delete	375
90.1.5	rmon-alarm modify	375
90.2	show	376
90.2.1	show rmon statistics	376
90.2.2	show rmon alarm	376
91	Script File	377
91.1	script	377
91.1.1	script apply	377
91.1.2	script validate	377
91.1.3	script list system	377
91.1.4	script list envm	377
91.1.5	script delete	377
91.2	copy	377
91.2.1	copy script envm	377
91.2.2	copy script remote	378
91.2.3	copy script nvm	378
91.2.4	copy script running-config nvm	378
91.2.5	copy script running-config envm	378
91.2.6	copy script running-config remote	378
91.3	show	379
91.3.1	show script envm	379
91.3.2	show script system	379
92	Selftest	380
92.1	selftest	380
92.1.1	selftest action	380
92.1.2	selftest ramtest	380
92.1.3	selftest system-monitor	380
92.1.4	selftest boot-default-on-error	380
92.1.5	selftest push-button	381
92.2	show	381
92.2.1	show selftest action	381
92.2.2	show selftest settings	381
93	sFlow	382
93.1	sflow	382
93.1.1	sflow receiver	382
93.2	sflow	382
93.2.1	sflow poller receiver	382
93.2.2	sflow poller interval	382

93.2.3 sflow sampler receiver	382
93.2.4 sflow sampler rate	383
93.2.5 sflow sampler maxheadersize	383
93.3 show	383
93.3.1 show sflow agent	383
93.3.2 show sflow receivers	383
93.3.3 show sflow pollers	383
93.3.4 show sflow samplers	383
94 Small Form-factor Pluggable (SFP)	384
94.1 show	384
94.1.1 show sfp	384
95 Signal Contact	385
95.1 signal-contact	385
95.1.1 signal-contact mode	385
95.1.2 signal-contact monitor link-failure	385
95.1.3 signal-contact monitor module-removal	385
95.1.4 signal-contact monitor fan-failure	385
95.1.5 signal-contact monitor envm-not-in-sync	386
95.1.6 signal-contact monitor envm-removal	386
95.1.7 signal-contact monitor temperature	386
95.1.8 signal-contact monitor ring-redundancy	386
95.1.9 signal-contact monitor power-supply	387
95.1.10signal-contact monitor ethernet-loops	387
95.1.11signal-contact monitor humidity	387
95.1.12signal-contact monitor stp-blocking	387
95.1.13signal-contact state	387
95.1.14signal-contact trap	388
95.1.15signal-contact module	388
95.1.16signal-contact fan-module	388
95.2 signal-contact	388
95.2.1 signal-contact link-alarm	388
95.3 show	389
95.3.1 show signal-contact	389
96 Signed Firmware	390
96.1 firmware	390
96.1.1 firmware allow-unsigned	390
96.2 show	390
96.2.1 show firmware allow-unsigned	390
96.2.2 show firmware ca-cert	390
97 Slot	391
97.1 slot	391
97.1.1 slot operation	391
97.1.2 slot module	391
97.2 show	391
97.2.1 show slot	391
98 Switched Monitoring (SMON)	392
98.1 monitor	392
98.1.1 monitor session	392
98.2 rspan-vlan	392
98.2.1 rspan-vlan	392
98.3 show	393
98.3.1 show monitor session	393
98.4 clear	393
98.4.1 clear monitor session	393

99	Simple Network Management Protocol (SNMP)	394
99.1	snmp	394
99.1.1	snmp access version v1	394
99.1.2	snmp access version v2	394
99.1.3	snmp access version v3	394
99.1.4	snmp access port	394
99.1.5	snmp access snmp-over-802	394
99.1.6	snmp notification user add	395
99.1.7	snmp notification user delete	395
99.1.8	snmp notification host add	395
99.1.9	snmp notification host delete	395
99.2	show	395
99.2.1	show snmp access	396
99.2.2	show snmp notification users	396
99.2.3	show snmp notification hosts	396
100	SNMP Community	397
100.1	snmp	397
100.1.1	snmp community ro	397
100.1.2	snmp community rw	397
100.2	show	397
100.2.1	show snmp community	397
101	SNMP Logging	398
101.1	logging	398
101.1.1	logging snmp-request get operation	398
101.1.2	logging snmp-request get severity	398
101.1.3	logging snmp-request set operation	398
101.1.4	logging snmp-request set severity	399
101.2	show	399
101.2.1	show logging snmp	399
102	Simple Network Time Protocol (SNTP)	400
102.1	sntp	400
102.1.1	sntp client operation	400
102.1.2	sntp client operating-mode	400
102.1.3	sntp client request-interval	400
102.1.4	sntp client broadcast-rcv-timeout	400
102.1.5	sntp client disable-after-sync	400
102.1.6	sntp client interface	401
102.1.7	sntp client server add	401
102.1.8	sntp client server delete	401
102.1.9	sntp client server mode	401
102.1.10	sntp server operation	401
102.1.11	sntp server interface	401
102.1.12	sntp server port	402
102.1.13	sntp server only-if-synchronized	402
102.1.14	sntp server broadcast operation	402
102.1.15	sntp server broadcast address	402
102.1.16	sntp server broadcast port	402
102.1.17	sntp server broadcast interval	402
102.1.18	sntp server broadcast vlan	402
102.2	show	403
102.2.1	show sntp global	403
102.2.2	show sntp client status	403
102.2.3	show sntp client server	403
102.2.4	show sntp server status	403
102.2.5	show sntp server broadcast	403
103	Spanning Tree	404
103.1	spanning-tree	404
103.1.1	spanning-tree drstp trap-mode	404

103.1.2spanning-tree drstp bpdu-filter	404
103.1.3spanning-tree drstp bpdu-guard	404
103.1.4spanning-tree drstp forward-time	404
103.1.5spanning-tree drstp hello-time	404
103.1.6spanning-tree drstp hold-count	405
103.1.7spanning-tree drstp max-age	405
103.1.8spanning-tree drstp max-hops	405
103.1.9spanning-tree drstp mst priority	405
103.1.10spanning-tree drstp ring-only-mode operation	405
103.1.11spanning-tree drstp ring-only-mode first-port	405
103.1.12spanning-tree drstp ring-only-mode second-port	405
103.1.13spanning-tree operation	406
103.1.14spanning-tree trap-mode	406
103.1.15spanning-tree bpdu-filter	406
103.1.16spanning-tree bpdu-guard	406
103.1.17spanning-tree bpdu-migration-check	406
103.1.18spanning-tree forceversion	406
103.1.19spanning-tree forward-time	407
103.1.20spanning-tree hello-time	407
103.1.21spanning-tree hold-count	407
103.1.22spanning-tree max-age	407
103.1.23spanning-tree ring-only-mode operation	407
103.1.24spanning-tree ring-only-mode first-port	407
103.1.25spanning-tree ring-only-mode second-port	407
103.1.26spanning-tree max-hops	408
103.1.27spanning-tree mst priority	408
103.1.28spanning-tree mst instance add	408
103.1.29spanning-tree mst instance delete	408
103.1.30spanning-tree mst instance modify	408
103.1.31spanning-tree configuration name	408
103.1.32spanning-tree configuration revision	409
103.2 spanning-tree	409
103.2.1spanning-tree mode	409
103.2.2spanning-tree bpdu-flood	409
103.2.3spanning-tree bpdu-filter	409
103.2.4spanning-tree edge-auto	409
103.2.5spanning-tree edge-port	410
103.2.6spanning-tree guard-loop	410
103.2.7spanning-tree guard-root	410
103.2.8spanning-tree guard-tcn	410
103.2.9spanning-tree cost	410
103.2.10spanning-tree priority	410
103.2.11spanning-tree mst	411
103.3 show	411
103.3.1show spanning-tree global	411
103.3.2show spanning-tree drstp	411
103.3.3show spanning-tree mst instance	411
103.3.4show spanning-tree mst port	411
103.3.5show spanning-tree mst vlan	411
103.3.6show spanning-tree port	412
104 Subring Management	413
104.1 sub-ring	413
104.1.1sub-ring operation	413
104.1.2sub-ring add	413
104.1.3sub-ring delete	413
104.1.4sub-ring enable	413
104.1.5sub-ring disable	414
104.1.6sub-ring modify	414
104.2 show	414
104.2.1show sub-ring global	414
104.2.2show sub-ring ring	414
105 Secure Shell (SSH)	415
105.1 ssh	415
105.1.1ssh server	415
105.1.2ssh timeout	415

105.1.3ssh port	415
105.1.4ssh max-sessions	415
105.1.5ssh outbound max-sessions	415
105.1.6ssh outbound timeout	415
105.1.7ssh key rsa	416
105.1.8ssh key fingerprint-type	416
105.2 ssh	416
105.2.1ssh	416
105.3 copy	416
105.3.1copy sshkey remote	416
105.3.2copy sshkey envm	416
105.4 show	417
105.4.1show ssh	417
106 Storm Control	418
106.1 storm-control	418
106.1.1storm-control flow-control	418
106.2 traffic-shape	418
106.2.1traffic-shape bw	418
106.3 mtu	418
106.3.1mtu	418
106.4 mtu	418
106.4.1mtu	418
106.5 mtu	419
106.5.1mtu	419
106.6 storm-control	419
106.6.1storm-control flow-control	419
106.6.2storm-control ingress unit	419
106.6.3storm-control ingress threshold	419
106.6.4storm-control ingress unicast operation	419
106.6.5storm-control ingress unicast threshold	420
106.6.6storm-control ingress unknown-frames operation	420
106.6.7storm-control ingress unknown-frames threshold	420
106.6.8storm-control ingress multicast operation	420
106.6.9storm-control ingress multicast threshold	420
106.6.10storm-control ingress multicast threshold	420
106.6.11storm-control ingress broadcast operation	421
106.6.12storm-control ingress broadcast threshold	421
106.7 show	421
106.7.1show storm-control flow-control	421
106.7.2show storm-control ingress	421
106.7.3show traffic-shape	421
106.7.4show mtu	421
107 System	422
107.1 system	422
107.1.1system name	422
107.1.2system location	422
107.1.3system contact	422
107.1.4system port-led-mode	422
107.1.5system pre-login-banner operation	422
107.1.6system pre-login-banner text	423
107.1.7system resources operation	423
107.2 temperature	423
107.2.1temperature upper-limit	423
107.2.2temperature lower-limit	423
107.3 humidity	423
107.3.1humidity upper-limit	423
107.3.2humidity lower-limit	424
107.4 hardware	424
107.4.1hardware runtime-bypass	424

107.4.2hardware systemoff-bypass	424
107.5 show	424
107.5.1show eventlog	424
107.5.2show system info	424
107.5.3show system port-led-mode	425
107.5.4show system pre-login-banner	425
107.5.5show system flash-status	425
107.5.6show system temperature limits	425
107.5.7show system temperature extremes	425
107.5.8show system temperature histogram	425
107.5.9show system temperature counters	425
107.5.10show system humidity limits	425
107.5.11show system humidity extremes	425
107.5.12show system humidity histogram	425
107.5.13show system resources	426
107.5.14show psu slot	426
107.5.15show psu unit	426
107.5.16show fan	426
107.5.17show hardware runtime-bypass	426
107.5.18show hardware systemoff-bypass	426
108 Telnet	427
108.1 telnet	427
108.1.1telnet server	427
108.1.2telnet timeout	427
108.1.3telnet port	427
108.1.4telnet max-sessions	427
108.2 telnet	427
108.2.1telnet	427
108.3 show	428
108.3.1show telnet	428
109 Time Range	429
109.1 time	429
109.1.1time range	429
109.2 show	430
109.2.1show time-range	430
110 Tracking	431
110.1 track	431
110.1.1track add	431
110.1.2track delete	431
110.1.3track enable	431
110.1.4track disable	431
110.1.5track trap	431
110.1.6track description	432
110.1.7track modify interface	432
110.1.8track modify ping	432
110.1.9track modify logical	432
110.2 show	433
110.2.1show track overview	433
110.2.2show track interface	433
110.2.3show track ping	433
110.2.4show track logical	433
110.2.5show track application	433
111 Traps	434
111.1 snmp	434
111.1.1snmp trap operation	434
111.1.2snmp trap mode	434
111.1.3snmp trap delete	434
111.1.4snmp trap add	434
111.2 show	434

111.2.1show snmp traps	435
112 Time Sensitive Networks (TSN)	436
112.1 tsn	436
112.1.1tsn operation	436
112.1.2tsn base-time	436
112.1.3tsn cycle-time	436
112.2 tsn	436
112.2.1tsn sdu traffic-class	436
112.2.2tsn gates operation	437
112.2.3tsn commit	437
112.2.4tsn base-time	437
112.2.5tsn default-gate-states	437
112.2.6tsn cycle-time	437
112.2.7tsn gcl add	437
112.2.8tsn gcl template	438
112.2.9tsn gcl modify	438
112.2.10tsn gcl delete	438
112.3 show	438
112.3.1show tsn global	438
112.3.2show tsn sdu	439
112.3.3show tsn gcl	439
112.3.4show tsn configuration	439
113 TTDP	440
113.1 ttdp	440
113.1.1ttdp operation	440
113.1.2ttdp backbone-id	440
113.1.3ttdp etbn inhibit	440
113.1.4ttdp etbn role	440
113.1.5ttdp consist etbn-number	441
113.1.6ttdp consist cn-number	441
113.1.7ttdp consist local-etbn-number	441
113.1.8ttdp consist uuid	441
113.1.9ttdp consist cn-to-etbn etbn	441
113.2 show	442
113.2.1show ttdp global	442
113.2.2show ttdp local-consist	442
113.2.3show ttdp internal-info	442
113.2.4show ttdp local-etbn-info	442
113.2.5show ttdp networks	442
113.2.6show ttdp consists-etbns	442
113.2.7show ttdp consists-cns	442
113.2.8show ttdp consists	442
113.2.9show ttdp directions	442
113.2.10show ttdp lines	443
113.2.11show ttdp hello-statistics	443
113.2.12show ttdp topology corrected-connectivity-table	443
113.2.13show ttdp topology connectivity-vector	443
113.2.14show ttdp topology etbn-vector	443
114 Unicast Routing	444
114.1 routing	444
114.1.1routing add	444
114.1.2routing delete	444
114.2 ip	444
114.2.1ip routing	444
114.2.2ip source-routing	444
114.2.3ip proxy-arp max-delay	444
114.3 show	445
114.3.1show ip global	445
114.4 show	445
114.4.1show ip interface	445
114.4.2show ip statistics	445

114.4.3show ip template	445
114.5 ip	445
114.5.1ip routing	445
114.5.2ip proxy-arp operation	445
114.5.3ip address secondary	446
114.5.4ip address primary	446
114.5.5ip mtu	446
114.5.6ip icmp unreachable	446
114.5.7ip icmp redirects	446
114.5.8ip netdirbcast	447
114.6 ip	447
114.6.1ip route add	447
114.6.2ip route modify	447
114.6.3ip route delete	447
114.6.4ip route distance	447
114.6.5ip route track add	448
114.6.6ip route track delete	448
114.6.7ip default-route add	448
114.6.8ip default-route modify	448
114.6.9ip default-route delete	448
114.6.10ip default-route track add	448
114.6.11ip default-route track delete	449
114.6.12ip reject-route add	449
114.6.13ip reject-route modify	449
114.6.14ip reject-route delete	449
114.6.15ip template	449
114.6.16ip loopback add	449
114.6.17ip loopback delete	450
114.6.18ip icmp redirects	450
114.6.19ip icmp echo-reply	450
114.6.20ip icmp rate-limit interval	450
114.6.21ip icmp rate-limit interval	450
114.6.22ip icmp rate-limit burst-size	450
114.6.23ip icmp rate-limit burst-size	451
114.6.24ip source-interface file-transfers	451
114.7 show	451
114.7.1show ip route all	451
114.7.2show ip route local	451
114.7.3show ip route static	451
114.7.4show ip route entry	451
114.7.5show ip route tracking	451
114.7.6show ip entry	451
115 User Management	453
115.1 show	453
115.1.1show custom-role global	453
115.1.2show custom-role commands	453
116 Users	454
116.1 users	454
116.1.1users add	454
116.1.2users delete	454
116.1.3users enable	454
116.1.4users disable	454
116.1.5users password	454
116.1.6users snmpv3 authentication	454
116.1.7users snmpv3 encryption	455
116.1.8users snmpv3 password encryption	455
116.1.9users snmpv3 password authentication	455
116.1.10users access-role	455
116.1.11users lock-status	455
116.1.12users password-policy-check	455
116.2 show	455
116.2.1show users	456

117	Virtual LAN (VLAN)	457
117.1	name	457
117.1.1	name	457
117.2	vlan-unaware-mode	457
117.2.1	vlan-unaware-mode	457
117.3	vlan	457
117.3.1	vlan add	457
117.3.2	vlan delete	457
117.4	vlan	457
117.4.1	vlan acceptframe	458
117.4.2	vlan ingressfilter	458
117.4.3	vlan priority	458
117.4.4	vlan pvid	458
117.4.5	vlan tagging	458
117.4.6	vlan participation include	458
117.4.7	vlan participation exclude	459
117.4.8	vlan participation auto	459
117.5	show	459
117.5.1	show vlan id	459
117.5.2	show vlan brief	459
117.5.3	show vlan port	459
117.5.4	show vlan member current	459
117.5.5	show vlan member static	459
117.6	network	459
117.6.1	network management vlan	460
117.6.2	network management priority dot1p	460
117.6.3	network management priority ip-dscp	460
118	Voice VLAN	461
118.1	voice	461
118.1.1	voice vlan	461
118.2	voice	461
118.2.1	voice vlan vlan-id	461
118.2.2	voice vlan dot1p	461
118.2.3	voice vlan dscp	462
118.2.4	voice vlan none	462
118.2.5	voice vlan untagged	462
118.2.6	voice vlan disable	462
118.2.7	voice vlan auth	462
118.2.8	voice vlan data priority	462
118.3	show	463
118.3.1	show voice vlan global	463
118.3.2	show voice vlan interface	463
A	Further support	464
B	Readers' Comments	465

Safety instructions



WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.

Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

UNWANTED APPLICATION BEHAVIOR

Configuration of the Ethernet devices shall be done by an Ethernet expert.

Before you start any application based on an AFS and/or AFF network, be sure to complete the configuration of all Ethernet devices correctly.

Failure to follow these instructions can result in equipment damage, serious injury or even death.

First login (Password change)

To help prevent undesired access to the device, it is imperative that you change the default password during initial setup.

Perform the following steps:

- ☐ Open the Graphical User Interface, the HiView application, or the Command Line Interface the first time you log in.
- ☐ Log in with the default password.
The device prompts you to type in a new password.
- ☐ Type in your new password.
To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.
- ☐ The device prompts you to confirm your new password.
- ☐ Log in again with your new password.

Anmerkung: If you lost your password, then contact your local support team.

For further information, see hirschmann-support.belden.com.

About this Manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

The “Configuration” user manual contains the information you need to start operating the device. It takes you step by step from the first startup operation through to the basic settings for operation in your environment.

The “Graphical User Interface” reference manual contains detailed information on using the graphical user interface to operate the individual functions of the device.

The “Command Line Interface (CLI) - HiOS Overview” reference manual contains a command reference with detailed information on using the CLI to operate the functions of HiOS devices.

The Industrial HiVision Network Management software provides you with additional options for smooth configuration and monitoring:

- ▶ Auto-topology discovery
- ▶ Browser interface
- ▶ Client/server structure
- ▶ Event handling
- ▶ Event log
- ▶ Simultaneous configuration of multiple devices
- ▶ Graphical user interface with network layout
- ▶ SNMP/OPC gateway

Reference Manual CLI - Global Overview

The “Command Line Interface (CLI) - HiOS Overview” reference manual contains a command reference with detailed information on using the CLI to operate the functions of HiOS devices.

The manual provides an overview of the CLI commands universally available on the devices with HiOS Software Release 9.4.

The scope of CLI commands available on your individual device depends on the device type and on the HiOS software level on your device.

1 Address Conflict Detection (ACD)

1.1 address-conflict

Configure the address conflict settings.

1.1.1 address-conflict operation

Enable or disable the address conflict detection for the management interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict operation
- no address-conflict operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no address-conflict operation

1.1.2 address-conflict detection-mode

Configure the detection mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict detection-mode <P-1>

Parameter	Value	Meaning
P-1	active-and-passive	Configure active and passive detection. During the IP address configuration, if you set the detection to 'active', then the device sends ARP or NDP probes into the network, and if you set the detection to 'passive', then the device listens continuously on the network.
	active-only	Configure only active detection. During IP address configuration 'active' the device sends only one ARP or NDP probe into the network.
	passive-only	Configure passive detection. The device listens passively on the network to verify that another device does not have the same IP address assigned.

1.1.3 address-conflict detection-ongoing

Enable or disable the ongoing detection. If enabled, the device sends periodic ARP or NDP probes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict detection-ongoing
- no address-conflict detection-ongoing
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no address-conflict detection-ongoing

1.1.4 address-conflict delay

The maximum detection delay time in milliseconds. Time gap between ARP or NDP probes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict delay <P-1>

Parameter	Value	Meaning
P-1	20..500	Time gap between consecutive ARP or NDP probes ([ms], default 200).

1.1.5 address-conflict release-delay

Delay in seconds to the next ARP or NDP probe cycle after an IP address conflict was detected.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict release-delay <P-1>

Parameter	Value	Meaning
P-1	3..3600	Delay between consecutive probe cycles after a conflict was detected ([sec], default 15).

1.1.6 address-conflict max-protection

Maximum number of frequent address protections.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict max-protection <P-1>

Parameter	Value	Meaning
P-1	0..100	Maximum number of frequent address protections (default 1).

1.1.7 address-conflict protect-interval

Delay in milliseconds between two consecutive address protections.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict protect-interval <P-1>

Parameter	Value	Meaning
P-1	20..10000	Delay between two consecutive protections ([ms], default 10000).

1.1.8 address-conflict trap-status

If enabled, this trap reports an address conflict.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict trap-status

- no address-conflict trap-status
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no address-conflict trap-status

1.1.9 address-conflict routing trap

Enable or disable sending of IP address conflict traps.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: address-conflict routing trap
- no address-conflict routing trap
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no address-conflict routing trap

1.1.10 address-conflict routing probe

Send arp packets on routing interfaces to detect conflicting IP addresses.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict routing probe

1.1.11 address-conflict routing clear

Clear the recorded IP address conflict.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: address-conflict routing clear

1.2 mac-address-conflict

Enable/Disable sending a trap if a packet with the MAC of this device is detected in the network.

1.2.1 mac-address-conflict operation

Enable or disable the MAC address conflict detection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac-address-conflict operation

■ no mac-address-conflict operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mac-address-conflict operation

1.3 show

Display device options and settings.

1.3.1 show address-conflict global

Display the component mode.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show address-conflict global

1.3.2 show address-conflict detected

Display the last detected address conflict.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show address-conflict detected

1.3.3 show address-conflict fault-state

Display the current conflict status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show address-conflict fault-state

1.3.4 show address-conflict routing

Display the IP address conflict information for routing addresses.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show address-conflict routing

1.3.5 show mac-address-conflict global

Display the component mode.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac-address-conflict global

2 Access Control List (ACL)

2.1 mac

Set MAC parameters.

2.1.1 mac access-list extended name

Create a MAC access-list.

► **Mode:** Global Config Mode

► **Privilege Level:** Operator

► **Format:** mac access-list extended name <P-1> [index <P-2>] deny src <P-3> dst <P-4> [ethertype <P-5>] [vlan <P-6> <P-7>] [cos <P-8>] [log] [time-range <P-9>] permit src <P-10> dst <P-11> [ethertype <P-12>] [vlan <P-13> <P-14>] [cos <P-15>] [time-range <P-16>] [assign-queue <P-17>] [mirror <P-18>] [rate-limit <P-19> <P-20>] [redirect <P-21>] [rate-limit <P-22> <P-23>]

[index]: Specify an index for the ACL rule.

deny: Create a new rule for the current MAC access-list: Specify packets to reject.

src: Specify the source MAC and Mask.

dst: Specify the destination MAC and Mask

[ethertype]: Specify the EtherType

[vlan]: Configure a match condition based on a VLAN ID.

[cos]: Configure a match condition based on a COS value(VLAN priority).

[log]: Enable logging.

[time-range]: Activate the rule at an absolute time or periodically.

permit: Create a new rule for the current MAC access-list: Specify packets to forward.

src: Specify source MAC and Mask

dst: Specify the destination MAC and Mask

[ethertype]: Specify the Ethertype

[vlan]: Configure a match condition based on a VLAN ID.

[cos]: Set COS field

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.

[mirror]: Set Mirror Interface.

[rate-limit]: Set rate limit and burst size.

[redirect]: Set Redirect Interface.

[rate-limit]: Set rate limit and burst size.

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..1023	Access-list rule index.
P-3	any srcmac-macmask	Enter for any source mac address and mask. Enter source MAC and source MAC mask.
P-4	any destmac-macmask	Enter for any destination mac address and mask. Enter destination MAC and destination MAC mask.
P-5	0x0600-0xffff appletalk arp ibmsna ipv4 ipv6 ipx-old mplsmcast mplsucast netbios novell pppoe rarp	Ethertype value Appletalk ARP IBMSNA IPv4 IPv6 IPX-OLD MPLS Multicast MPLS Unicast NetBIOS NOVELL PPPoE RARP
P-6	eq	Specify VLAN value.
P-7	1..4094	Enter the VLAN ID.
P-8	0..7	COS
P-9	string	<name> Time-range name
P-10	any srcmac-macmask	Enter for any source mac address and mask. Enter source MAC and source MAC mask.

Parameter	Value	Meaning
P-11	any	Enter for any destination mac address and mask.
	destmac-macmask	Enter destination MAC and destination MAC mask.
P-12	0x0600-0xffff	Ethertype value
	appletalk	Appletalk
	arp	ARP
	ibmsna	IBMSNA
	ipv4	IPv4
	ipv6	IPv6
	ipx-old	IPX-OLD
	mplsmcast	MPLS Multicast
	mplsucast	MPLS Unicast
	netbios	NetBIOS
	novell	NOVELL
	pppoe	PPPoE
	rarp	RARP
P-13	eq	Specify VLAN value.
P-14	1..4042	Enter the VLAN ID.
P-15	0..7	COS
P-16	string	<name> Time-range name
P-17	0..7	User priority (VLAN priority).
P-18	slot no./port no.	
P-19	0..10000000	Committed rate value, specified in kbps.
P-20	0..128	Committed burst size value, specified in kbytes.
P-21	slot no./port no.	
P-22	0..10000000	Committed rate value, specified in kbps.
P-23	0..128	Committed burst size value, specified in kbytes.

2.1.2 mac access-list extended rename

Rename an existing MAC access-list

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-list extended rename <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	string	<name> ACL name.

2.1.3 mac access-list extended del

Delete a MAC access-list.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: mac access-list extended del <P-1> [index <P-2>]
- [index]: Specify an index for the ACL rule.

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..1023	Access-list rule index.

2.1.4 mac access-group name

Associate an ACL identified by name with a VLAN ID.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-group name <P-1> vlan <P-2> <P-3> [sequence <P-4>]

vlan: VLAN ID

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no mac access-group name
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mac access-group name <P-1> vlan [sequence]

2.1.5 mac access-group del

Disassociate an ACL identified by name with a VLAN ID.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac access-group del <P-1> vlan <P-2> <P-3> [sequence <P-4>]

vlan: VLAN ID

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no mac access-group del
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mac access-group del <P-1> vlan [sequence]

2.2 mac

Set MAC parameters.

2.2.1 mac access-list extended name

Create a MAC access-list.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac access-list extended name <P-1> [index <P-2>] deny src <P-3> dst <P-4> [ethertype <P-5>] [vlan <P-6> <P-7>] [cos <P-8>] [log] [time-range <P-9>] permit src <P-10> dst <P-11> [ethertype <P-12>] [vlan <P-13> <P-14>] [cos <P-15>] [time-range <P-16>] [assign-queue <P-17>] [mirror <P-18>] [rate-limit <P-19> <P-20>] [redirect <P-21>] [rate-limit <P-22> <P-23>]

[index]: Specify an index for the ACL rule.

deny: Create a new rule for the current MAC access-list: Specify packets to reject.

src: Specify the source MAC and Mask.

dst: Specify the destination MAC and Mask

[ethertype]: Specify the EtherType

[vlan]: Configure a match condition based on a VLAN ID.

[cos]: Configure a match condition based on a COS value(VLAN priority).

[log]: Enable logging.

[time-range]: Activate the rule at an absolute time or periodically.

permit: Create a new rule for the current MAC access-list: Specify packets to forward.

src: Specify source MAC and Mask

dst: Specify the destination MAC and Mask

[ethertype]: Specify the EtherType

[vlan]: Configure a match condition based on a VLAN ID.

[cos]: Set COS field

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.

[mirror]: Set Mirror Interface.

[rate-limit]: Set rate limit and burst size.

[redirect]: Set Redirect Interface.

[rate-limit]: Set rate limit and burst size.

Parameter	Value	Meaning
P-1	string	<name> ACL name.

Parameter	Value	Meaning
P-2	1..1023	Access-list rule index.
P-3	any	Enter for any source mac address and mask.
	srcmac-macmask	Enter source MAC and source MAC mask.
P-4	any	Enter for any destination mac address and mask.
	destmac-macmask	Enter destination MAC and destination MAC mask.
P-5	0x0600-0xffff	Ethertype value
	appletalk	Appletalk
	arp	ARP
	ibmsna	IBMSNA
	ipv4	IPv4
	ipv6	IPv6
	ipx-old	IPX-OLD
	mplsmcast	MPLS Multicast
	mplsucast	MPLS Unicast
	netbios	NetBIOS
	novell	NOVELL
	pppoe	PPPoE
	rarp	RARP
P-6	eq	Specify VLAN value.
P-7	1..4042	Enter the VLAN ID.
P-8	0..7	COS
P-9	string	<name> Time-range name
P-10	any	Enter for any source mac address and mask.
	srcmac-macmask	Enter source MAC and source MAC mask.
P-11	any	Enter for any destination mac address and mask.
	destmac-macmask	Enter destination MAC and destination MAC mask.
P-12	0x0600-0xffff	Ethertype value
	appletalk	Appletalk
	arp	ARP
	ibmsna	IBMSNA
	ipv4	IPv4
	ipv6	IPv6
	ipx-old	IPX-OLD
	mplsmcast	MPLS Multicast
	mplsucast	MPLS Unicast
	netbios	NetBIOS
	novell	NOVELL
	pppoe	PPPoE
	rarp	RARP
P-13	eq	Specify VLAN value.
P-14	1..4042	Enter the VLAN ID.
P-15	0..7	COS
P-16	string	<name> Time-range name
P-17	0..7	User priority (VLAN priority).
P-18	slot no./port no.	
P-19	0..10000000	Committed rate value, specified in kbps.
P-20	0..128	Committed burst size value, specified in kbytes.
P-21	slot no./port no.	
P-22	0..10000000	Committed rate value, specified in kbps.
P-23	0..128	Committed burst size value, specified in kbytes.

2.2.2 mac access-list extended rename

Rename an existing MAC access-list

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-list extended rename <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	string	<name> ACL name.

2.2.3 mac access-list extended del

Delete a MAC access-list.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-list extended del <P-1> [index <P-2>]
[index]: Specify an index for the ACL rule.

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..1023	Access-list rule index.

2.2.4 mac access-group name

Associate an ACL identified by name with a VLAN ID.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-group name <P-1> vlan <P-2> <P-3> [sequence <P-4>]
vlan: VLAN ID
[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no mac access-group name
Disable the option
 - Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: no mac access-group name <P-1> vlan [sequence]

2.2.5 mac access-group del

Disassociate an ACL identified by name with a VLAN ID.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: mac access-group del <P-1> vlan <P-2> <P-3> [sequence <P-4>]
vlan: VLAN ID
[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no mac access-group del
Disable the option
 - Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: no mac access-group del <P-1> vlan [sequence]

2.3 mac

MAC interface commands.

2.3.1 mac access-group name

Associate a specific MAC access-list identified by name with an interface, in a given direction.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: mac access-group name <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	in	Inbound direction.
	out	Outbound direction.
P-3	1..4294967295	Sequence

- no mac access-group name
 - Disable the option
 - Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: no mac access-group name <P-1> [sequence]

2.3.2 mac access-group del

Remove a specific MAC access-list identified by name from an interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: mac access-group del <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	in	Inbound direction.
	out	Outbound direction.
P-3	1..4294967295	Sequence

- no mac access-group del
 - Disable the option
 - Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: no mac access-group del <P-1> <P-2> [sequence]

2.4 mac

MAC interface commands.

2.4.1 mac access-group name

Associate a specific MAC access-list identified by name with an interface, in a given direction.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: mac access-group name <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	in	Inbound direction.
	out	Outbound direction.
P-3	1..4294967295	Sequence

- no mac access-group name
 - Disable the option
 - Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: no mac access-group name <P-1> [sequence]

2.4.2 mac access-group del

Remove a specific MAC access-list identified by name from an interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: mac access-group del <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.

Parameter	Value	Meaning
P-2	in	Inbound direction.
	out	Outbound direction.
P-3	1..4294967295	Sequence

■ no mac access-group del

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mac access-group del <P-1> <P-2> [sequence]

2.5 ip

Set IP parameters.

2.5.1 ip access-list extended name

Create an IP access-list.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip access-list extended name <P-1> [index <P-2>] deny src <P-3> [<P-4> <P-5>] dst <P-6> [<P-7> <P-8>] [proto <P-9>] [flag [<P-10>] [<P-11>] [<P-12>] [<P-13>] [<P-14>] [<P-15>] [<P-16>]] [icmp-type <P-17>] [icmp-code <P-18>] [igmp-type <P-19>] [fragments] [precedence <P-20>] [log] [time-range <P-21>] [assign-queue <P-22>] [tos <P-23> <P-24>] [log] [time-range <P-25>] [assign-queue <P-26>] [dscp <P-27>] [log] [time-range <P-28>] [assign-queue <P-29>] every [log] [time-range <P-30>] [assign-queue <P-31>] permit src <P-32> [<P-33> <P-34>] dst <P-35> [<P-36> <P-37>] [proto <P-38>] [flag [<P-39>] [<P-40>] [<P-41>] [<P-42>] [<P-43>] [<P-44>] [<P-45>]] [icmp-type <P-46>] [icmp-code <P-47>] [igmp-type <P-48>] [fragments] [precedence <P-49>] [time-range <P-50>] [mirror <P-51>] [rate-limit <P-52> <P-53>] [redirect <P-54>] [rate-limit <P-55> <P-56>] [tos <P-57> <P-58>] [time-range <P-59>] [assign-queue <P-60>] [mirror <P-61>] [rate-limit <P-62> <P-63>] [redirect <P-64>] [rate-limit <P-65> <P-66>] [dscp <P-67>] [time-range <P-68>] [assign-queue <P-69>] [mirror <P-70>] [rate-limit <P-71> <P-72>] [redirect <P-73>] [rate-limit <P-74> <P-75>] every [time-range <P-76>] [assign-queue <P-77>] [mirror <P-78>] [rate-limit <P-79> <P-80>] [redirect <P-81>] [rate-limit <P-82> <P-83>]

[index]: Specify an index for the ACL rule.

deny: Create a new rule for the current IP access-list: Specify packets to reject.

src: Specify the source IP and Mask

dst: Specify the destination IP and Mask

[proto]: Specify the protocol

[flag]: Specify TCP flag.

[icmp-type]: Specify ICMP type.

[icmp-code]: Specify ICMP code

[igmp-type]: Specify IGMP type.

[fragments]: Specify if rule matches on fragmented IP packets.

[precedence]: Precedence

[log]: Enable logging

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority)assignment attribute.

[tos]: TOS

[log]: Enable logging

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority)assignment attribute.

[dscp]: DSCP

[log]: Enable logging

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority)assignment attribute.

every: Every packet regardless the content.

[log]: Enable logging

[time-range]: Activate the rule at an absolute time or periodically.

[assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
 permit: Create a new rule for the current IP access-list: Specify packets to forward.
 src: Specify the source IP and Mask
 dst: Specify destination IP and Mask
 [proto]: Specify the protocol
 [flag]: Specify TCP flag.
 [icmp-type]: Specify ICMP type.
 [icmp-code]: Specify ICMP code
 [igmp-type]: Specify IGMP type.
 [fragments]: Specify if rule matches on fragmented IP packets.
 [precedence]: Precedence
 [time-range]: Activate the rule at an absolute time or periodically.
 [mirror]: Set Mirror Interface
 [rate-limit]: Set rate limit and burst size.
 [redirect]: Set Redirect Interface
 [rate-limit]: Set rate limit and burst size.
 [tos]: TOS
 [time-range]: Activate the rule at an absolute time or periodically.
 [assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
 [mirror]: Set Mirror Interface
 [rate-limit]: Set rate limit and burst size.
 [redirect]: Set Redirect Interface
 [rate-limit]: Set rate limit and burst size.
 [dscp]: DSCP
 [time-range]: Activate the rule at an absolute time or periodically.
 [assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
 [mirror]: Set Mirror Interface
 [rate-limit]: Set rate limit and burst size.
 [redirect]: Set Redirect Interface
 [rate-limit]: Set rate limit and burst size.
 every: Every packet regardless the content.
 [time-range]: Activate the rule at an absolute time or periodically.
 [assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
 [mirror]: Set Mirror Interface
 [rate-limit]: Set rate limit and burst size.
 [redirect]: Set Redirect Interface
 [rate-limit]: Set rate limit and burst size.

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..1023	Access-list rule index.
P-3	any	Enter for any source ip address and mask.
	a.b.c.d-e.f.g.h	Source IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.
P-4	eq	Specify value that port number must be equal to.
	neq	Specify value that port number must not be equal to.
	lt	Specify value that port number must be less than.
	gt	Specify value that port number must be greater than.
P-5	domain	Domain
	echo	Echo
	ftp	FTP
	ftpdata	FTP Data
	http	HTTP
	https	HTTPS
	smtp	SMTP
	snmp	SNMP
	telnet	Telnet
	ssh	SSH
	tftp	TFTP
	www	WWW
	1-65535	Port number
P-6	any	Enter for any destination ip address and mask.
	a.b.c.d-e.f.g.h	Destination IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.

Parameter	Value	Meaning
P-7	eq	Specify value that port number must be equal to.
	neq	Specify value that port number must not be equal to.
	lt	Specify value that port number must be less than.
	gt	Specify value that port number must be greater than.
P-8	domain	Domain
	echo	Echo
	ftp	FTP
	ftpdata	FTP Data
	http	HTTP
	https	HTTPS
	smtp	SMTP
	snmp	SNMP
	telnet	Telnet
	ssh	SSH
	tftp	TFTP
	www	WWW
P-9	1-65535	Port number
	icmp	ICMP
	igmp	IGMP
	ip-in-ip	IP-in-IP
	tcp	TCP
	udp	UDP
	ip	Any IP protocol
P-10	1-255	Protocol number
P-11	-fin	Match occurs if fin flag is not set in the TCP header.
	+fin	Match occurs if fin flag is set in the TCP header.
P-12	-syn	Match occurs if syn flag is not set in the TCP header.
	+syn	Match occurs if syn flag is set in the TCP header.
P-13	-rst	Match occurs if rst flag is not set in the TCP header.
	+rst	Match occurs if rst flag is set in the TCP header.
P-14	-psh	Match occurs if psh flag is not set in the TCP header.
	+psh	Match occurs if psh flag is set in the TCP header.
P-15	-ack	Match occurs if ack flag is not set in the TCP header.
	+ack	Match occurs if ack flag is set in the TCP header.
P-16	-urg	Match occurs if urg flag is not set in the TCP header.
	+urg	Match occurs if urg flag is set in the TCP header.
P-17	established	Match occurs if the specified RST and ACK bits are set in TCP header.
P-18	0..255	ICMP type value.
P-19	0..255	ICMP code value.
P-20	0..7	IP Precedence
P-21	string	<name> Time-range name
P-22	0..7	User priority (VLAN priority).
P-23	0..255	TOS
P-24	0..255	TOS Inverse Mask (0 for exact match)
P-25	string	<name> Time-range name
P-26	0..7	User priority (VLAN priority).
P-27	0..63	DSCP
P-28	string	<name> Time-range name
P-29	0..7	User priority (VLAN priority).
P-30	string	<name> Time-range name
P-31	0..7	User priority (VLAN priority).
P-32	any	Enter for any source ip address and mask.
	a.b.c.d-e.f.g.h	Source IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.
P-33	eq	Specify value that port number must be equal to.
	neq	Specify value that port number must not be equal to.
	lt	Specify value that port number must be less than.
	gt	Specify value that port number must be greater than.

Parameter	Value	Meaning
P-34	domain	Domain
	echo	Echo
	ftp	FTP
	ftpdata	FTP Data
	http	HTTP
	https	HTTPS
	smtp	SMTP
	snmp	SNMP
	telnet	Telnet
	ssh	SSH
	tftp	TFTP
	www	WWW
	1-65535	Port number
P-35	any	Enter for any destination ip address and mask.
	a.b.c.d.e.f.g.h	Destination IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.
P-36	eq	Specify value that port number must be equal to.
	neq	Specify value that port number must not be equal to.
	lt	Specify value that port number must be less than.
	gt	Specify value that port number must be greater than.
P-37	domain	Domain
	echo	Echo
	ftp	FTP
	ftpdata	FTP Data
	http	HTTP
	https	HTTPS
	smtp	SMTP
	snmp	SNMP
	telnet	Telnet
	ssh	SSH
	tftp	TFTP
	www	WWW
	1-65535	Port number
P-38	icmp	ICMP
	igmp	IGMP
	ip-in-ip	IP-in-IP
	tcp	TCP
	udp	UDP
	ip	Any IP protocol
	1-255	Protocol number
P-39	-fin	Match occurs if fin flag is not set in the TCP header.
	+fin	Match occurs if fin flag is set in the TCP header.
P-40	-syn	Match occurs if syn flag is not set in the TCP header.
	+syn	Match occurs if syn flag is set in the TCP header.
P-41	-rst	Match occurs if rst flag is not set in the TCP header.
	+rst	Match occurs if rst flag is set in the TCP header.
P-42	-psh	Match occurs if psh flag is not set in the TCP header.
	+psh	Match occurs if psh flag is set in the TCP header.
P-43	-ack	Match occurs if ack flag is not set in the TCP header.
	+ack	Match occurs if ack flag is set in the TCP header.
P-44	-urg	Match occurs if urg flag is not set in the TCP header.
	+urg	Match occurs if urg flag is set in the TCP header.
P-45	established	Match occurs if the specified RST and ACK bits are set in TCP header.
P-46	0..255	ICMP type value.
P-47	0..255	ICMP code value.
P-48	0..255	IGMP code value.
P-49	0..7	IP Precedence
P-50	string	<name> Time-range name
P-51	slot no./port no.	
P-52	0..10000000	Committed rate value, specified in kbps.
P-53	0..128	Committed burst size value, specified in kbytes.
P-54	slot no./port no.	
P-55	0..10000000	Committed rate value, specified in kbps.
P-56	0..128	Committed burst size value, specified in kbytes.
P-57	0..255	TOS
P-58	0..255	TOS Inverse Mask (0 for exact match)
P-59	string	<name> Time-range name

Parameter	Value	Meaning
P-60	0..7	User priority (VLAN priority).
P-61	slot no./port no.	
P-62	0..10000000	Committed rate value, specified in kbps.
P-63	0..128	Committed burst size value, specified in kbytes.
P-64	slot no./port no.	
P-65	0..10000000	Committed rate value, specified in kbps.
P-66	0..128	Committed burst size value, specified in kbytes.
P-67	0..63	DSCP
P-68	string	<name> Time-range name
P-69	0..7	User priority (VLAN priority).
P-70	slot no./port no.	
P-71	0..10000000	Committed rate value, specified in kbps.
P-72	0..128	Committed burst size value, specified in kbytes.
P-73	slot no./port no.	
P-74	0..10000000	Committed rate value, specified in kbps.
P-75	0..128	Committed burst size value, specified in kbytes.
P-76	string	<name> Time-range name
P-77	0..7	User priority (VLAN priority).
P-78	slot no./port no.	
P-79	0..10000000	Committed rate value, specified in kbps.
P-80	0..128	Committed burst size value, specified in kbytes.
P-81	slot no./port no.	
P-82	0..10000000	Committed rate value, specified in kbps.
P-83	0..128	Committed burst size value, specified in kbytes.

■ no ip access-list extended name

Disable the option

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: no ip access-list extended name <P-1> [index] deny src dst [proto] [flag] [icmp-type] [icmp-code] [igmp-type] [fragments] [precedence] [log] [time-range] [assign-queue] [tos] [log] [time-range] [assign-queue] [dscp] [log] [time-range] [assign-queue] every [log] [time-range] [assign-queue] permit src dst [proto] [flag] [icmp-type] [icmp-code] [igmp-type] [fragments] [precedence] [time-range] [mirror] [rate-limit] [redirect] [rate-limit] [tos] [time-range] [assign-queue] [mirror] [rate-limit] [redirect] [rate-limit] [dscp] [time-range] [assign-queue] [mirror] [rate-limit] [redirect] [rate-limit] every [time-range] [assign-queue] [mirror] [rate-limit] [redirect] [rate-limit]

2.5.2 ip access-list extended rename

Rename an existing IP access-list.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip access-list extended rename <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	string	<name> ACL name.

2.5.3 ip access-list extended del

Delete an IP access-list.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip access-list extended del <P-1> [index <P-2>]

[index]: Specify an index for the ACL rule.

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..1023	Access-list rule index.

2.5.4 ip access-group name

Associate an ACL identified by name with a VLAN ID.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip access-group name <P-1> vlan <P-2> <P-3> [sequence <P-4>]

vlan: VLAN ID

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no ip access-group name
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip access-group name <P-1> vlan [sequence]

2.5.5 ip access-group del

Disassociate an ACL identified by name with a VLAN ID.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip access-group del <P-1> vlan <P-2> <P-3> [sequence <P-4>]

vlan: VLAN ID

[sequence]: Indicate the sequence number

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	1..4042	Enter the VLAN ID.
P-3	in	Inbound direction.
	out	Outbound direction.
P-4	1..4294967295	Sequence

- no ip access-group del
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip access-group del <P-1> vlan [sequence]

2.6 ip

IP interface commands.

2.6.1 ip access-group name

Associate a specific IP access-list identified by name with an interface, in a given direction.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip access-group name <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the order

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	in	Inbound direction.
	out	Outbound direction.
P-3	1..4294967295	Sequence

- no ip access-group name
 - Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip access-group name <P-1> <P-2> [sequence]

2.6.2 ip access-group del

Remove a specific IP access-list identified by name from an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip access-group del <P-1> <P-2> [sequence <P-3>]

[sequence]: Indicate the order

Parameter	Value	Meaning
P-1	string	<name> ACL name.
P-2	in out	Inbound direction. Outbound direction.
P-3	1..4294967295	Sequence

- no ip access-group del
 - Disable the option
 - Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: no ip access-group del <P-1> <P-2> [sequence]

2.7 show

Display device options and settings.

2.7.1 show access-list global

Display the next free index for both MAC and IPv4 based access lists.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show access-list global

2.7.2 show access-list mac

Display the information for a specific MAC based access list.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show access-list mac [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..1023	Access-list rule index.

2.7.3 show access-list ip

Display the information for a specific IP based access list.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show access-list ip [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..1023	Access-list rule index.

2.7.4 show access-list assignment ip

Display the assignments of existing IP ACLs.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show access-list assignment ip <P-1>

Parameter	Value	Meaning
P-1	1000..1099	Access-list index.

2.7.5 show access-list assignment mac

Display the assignments of existing MAC ACLs.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show access-list assignment mac <P-1>

Parameter	Value	Meaning
P-1	10000..10099	Access-list index.

3 Application Lists

3.1 appllists

Configure an application list.

3.1.1 appllists set-authlist

Set an authentication list reference that shall be used by given application.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: `appllists set-authlist <P-1> <P-2>`

Parameter	Value	Meaning
P-1	string	<application> Name of an application list.
P-2	string	<authlist_name> Name of referenced authentication list.

3.1.2 appllists enable

Activate a login application list.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: `appllists enable <P-1>`

Parameter	Value	Meaning
P-1	string	<application> Name of an application list.

3.1.3 appllists disable

Deactivate a login application list.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: `appllists disable <P-1>`

Parameter	Value	Meaning
P-1	string	<application> Name of an application list.

3.2 show

Display device options and settings.

3.2.1 show appllists

Display the ordered methods for application lists.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: `show appllists`

4 Authentication Lists

4.1 authlists

Configure an authentication list.

4.1.1 authlists add

Create a new login authentication list.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: `authlists add <P-1>`

Parameter	Value	Meaning
P-1	string	<authlist_name> Name of an authentication list.

4.1.2 authlists delete

Delete an existing login authentication list.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: `authlists delete <P-1>`

Parameter	Value	Meaning
P-1	string	<authlist_name> Name of an authentication list.

4.1.3 authlists set-policy

Set the policies of a login authentication list.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: `authlists set-policy <P-1> <P-2> [<P-3> [<P-4> [<P-5> [<P-6>]]]]`

Parameter	Value	Meaning
P-1	string	<authlist_name> Name of an authentication list.
P-2	reject	Authentication is rejected / not allowed
	local	Authentication by local user DB
	radius	Authentication by RADIUS server
	ias	Authentication by IAS server
	ldap	Authentication by remote server
P-3	reject	Authentication is rejected / not allowed
	local	Authentication by local user DB
	radius	Authentication by RADIUS server
	ias	Authentication by IAS server
	ldap	Authentication by remote server
P-4	reject	Authentication is rejected / not allowed
	local	Authentication by local user DB
	radius	Authentication by RADIUS server
	ias	Authentication by IAS server
	ldap	Authentication by remote server
P-5	reject	Authentication is rejected / not allowed
	local	Authentication by local user DB
	radius	Authentication by RADIUS server
	ias	Authentication by IAS server
	ldap	Authentication by remote server
P-6	reject	Authentication is rejected / not allowed
	local	Authentication by local user DB
	radius	Authentication by RADIUS server
	ias	Authentication by IAS server
	ldap	Authentication by remote server

4.1.4 authlists enable

Activate a login authentication list.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: `authlists enable <P-1>`

Parameter	Value	Meaning
P-1	string	<authlist_name> Name of an authentication list.

4.1.5 authlists disable

Deactivate a login authentication list.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: authlists disable <P-1>

Parameter	Value	Meaning
P-1	string	<authlist_name> Name of an authentication list.

4.2 show

Display device options and settings.

4.2.1 show authlists

Display the ordered methods for authentication lists.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show authlists

5 Auto Disable

5.1 auto-disable

Configure the Auto Disable condition settings.

5.1.1 auto-disable reason

Enables/disables port Recovery by reason on this device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-disable reason <P-1>

Parameter	Value	Meaning
P-1	link-flap	Enable/disable link-flap.
	crc-error	Enable/disable crc-error.
	duplex-mismatch	Enable/disable duplex-mismatch.
	dhcp-snooping	Enable/disable dhcp-snooping.
	arp-rate	Enable/disable arp-rate.
	bpdu-rate	Enable/disable bpdu-rate.
	port-security	Enable/disable MAC based port security.
	overload-detection	Enable/disable overload-detection.
	speed-duplex	Enable/disable link speed and duplex monitor.
	loop-protection	Enable/disable loop protection.

- no auto-disable reason
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no auto-disable reason <P-1>

5.2 auto-disable

Configure the Auto Disable condition settings.

5.2.1 auto-disable timer

Timer value in seconds after a deactivated port is activated again. Possible values are: 30-4294967295. A value of 0 disables the timer.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-disable timer <P-1>

Parameter	Value	Meaning
P-1	30..4294967295	Timer value in seconds.

5.2.2 auto-disable reset

Reset the specific interface and reactivate the port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-disable reset [<P-1>]

Parameter	Value	Meaning
P-1	port	Press Enter to execute the command.

- no auto-disable reset
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no auto-disable reset [<P-1>]

5.3 show

Display device options and settings.

5.3.1 show auto-disable brief

Display the Auto Disable summary per interface.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show auto-disable brief

5.3.2 show auto-disable reasons

Display the summary of the detected Auto Disable error reasons.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show auto-disable reasons

6 Cabletest

6.1 cable-test

6.1.1 cable-test

Select port on which to perform the cable test.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: cable-test <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

7 Class Of Service

7.1 classofservice

Class of service configuration.

7.1.1 classofservice ip-dscp-mapping

ip-dscp-mapping configuration

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: classofservice ip-dscp-mapping <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	af11	
	af12	
	af13	
	af21	
	af22	
	af23	
	af31	
	af32	
	af33	
	af41	
	af42	
	af43	
	be	
	cs0	
	cs1	
	cs2	
	cs3	
	cs4	
	cs5	
	cs6	
	cs7	
	ef	
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
	16	
	17	
	18	
	19	
	20	
	21	
	22	
	23	
	24	
	25	
	26	
	27	
	28	
	29	
	30	
	31	
	32	
	33	
	34	
	35	
	36	
	37	
	38	
	39	
	40	
	41	
	42	
	43	
	44	
	45	

Parameter	Value	Meaning
P-2	0..7	Enter the Traffic Class value.
P-3	0..3	Enter the Traffic Class value.

7.1.2 classofservice dot1p-mapping

Enter a VLAN priority and the traffic class it should be mapped to.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: classofservice dot1p-mapping <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	0..7	Enter the 802.1p priority.
P-2	0..7	Enter the Traffic Class value.
P-3	0..3	Enter a number in the given range.

7.2 classofservice

Interface classofservice configuration.

7.2.1 classofservice trust

trust configuration

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: classofservice trust <P-1>

Parameter	Value	Meaning
P-1	untrusted	Sets the class of service trust mode to untrusted
	dot1p	Sets the class of service trust mode to dot1p.
	ip-dscp	Sets the class of service trust mode to IP DSCP.

7.3 cos-queue

COS queue configuration

7.3.1 cos-queue strict

strict priority scheduler (default)

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: cos-queue strict <P-1> <P-2>

Parameter	Value	Meaning
P-1	0..7	Enter a Queue Id from 0 to 7.
P-2	0..3	Enter a number in the given range.

7.3.2 cos-queue weighted

weighted scheduler

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: cos-queue weighted <P-1> <P-2>

Parameter	Value	Meaning
P-1	0..7	Enter a Queue Id from 0 to 7.
P-2	0..3	Enter a number in the given range.

7.3.3 cos-queue max-bandwidth

Maximum/shaped bandwidth for the queues

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: cos-queue max-bandwidth <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	0..3	Enter a number in the given range.
P-2	0..7	Enter a Queue Id from 0 to 7.
P-3	0..100	Enter a number in the given range.

7.3.4 cos-queue min-bandwidth

Minimum/guaranteed bandwidth for the queues when in weighted mode

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `cos-queue min-bandwidth <P-1> <P-2> <P-3>`

Parameter	Value	Meaning
P-1	0..3	Enter a number in the given range.
P-2	0..7	Enter a Queue Id from 0 to 7.
P-3	0..100	Enter a number in the given range.

7.4 show

Display device options and settings.

7.4.1 show classofservice ip-dscp-mapping

Display the ip-dscp-mapping configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show classofservice ip-dscp-mapping`

7.4.2 show classofservice dot1p-mapping

Display a table containing the vlan priority to traffic class mappings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show classofservice dot1p-mapping`

7.4.3 show classofservice trust

Display a table containing the trust mode of every interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show classofservice trust`

7.4.4 show cos-queue

Display the Class Of Service (CoS) queue parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show cos-queue`

8 Command Line Interface (CLI)

8.1 cli

Set the CLI preferences.

8.1.1 cli serial-timeout

Set login timeout for serial line connection to CLI. Setting to 0 will disable the timeout. The value is active after next login.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: cli serial-timeout <P-1>

Parameter	Value	Meaning
P-1	0..160	Enter a number in the given range. Setting to 0 will disable the timeout.

8.1.2 cli prompt

Change the system prompt. Following wildcards are allowed: %d date, %t time, %i IP address, %m MAC address, %p product name, %s short product name

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: cli prompt <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters. Following wildcards are allowed:\n %d date, %t time, %i IP address, %m MAC address, %p product name, %s short product name

8.1.3 cli numlines

Screen size for 'more' (23 = default). Enter a 0 will disable the feature. The value is only valid for the current session.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: cli numlines <P-1>

Parameter	Value	Meaning
P-1	0..250	Screen size for 'more' (23 = default). Enter a 0 will disable the feature. The value is only valid for the current session.

8.1.4 cli banner operation

Enable or disable the CLI login banner.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: cli banner operation

■ no cli banner operation

Disable the option

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no cli banner operation

8.1.5 cli banner text

Set the text for the CLI login banner (C printf format syntax allowed: \n \t).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: cli banner text <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 1024 characters (allowed characters are from ASCII 32 to 127).

8.2 show

Display device options and settings.

8.2.1 show cli global

Display the CLI preferences.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show cli global

8.2.2 show cli command-tree

Display a list of every command.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show cli command-tree

8.3 logging

Logging configuration.

8.3.1 logging cli-command

Enable or disable the CLI command logging.

- ▶ **Mode:** Global Config Mode
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** logging cli-command

■ no logging cli-command

Disable the option

- ▶ **Mode:** Global Config Mode
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** no logging cli-command

8.4 show

Display device options and settings.

8.4.1 show logging cli-command

Display the CLI command logging preferences.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show logging cli-command

9 Clock

9.1 clock

Configure local and DST clock settings.

9.1.1 clock set

Edit current local time.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clock set <P-1> <P-2>

Parameter	Value	Meaning
P-1	YYYY-MM-DD	Local date (range: 2004-01-01 - 2037-12-31).
P-2	HH:MM:SS	Local time.

9.1.2 clock timezone offset

Local time offset (in minutes) with respect to UTC (positive values for locations east of Greenwich).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clock timezone offset <P-1>

Parameter	Value	Meaning
P-1	-780..840	Edit the timezone offset (in minutes).

9.1.3 clock timezone zone

Edit the timezone acronym (max. 4 characters).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clock timezone zone <P-1>

Parameter	Value	Meaning
P-1	string	Edit the timezone acronym (max 4 characters).

9.1.4 clock summer-time mode

Configure summer-time mode parameters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clock summer-time mode <P-1>

Parameter	Value	Meaning
P-1	disable	Disable recurring summer-time mode.
	recurring	Enable recurring summer-time mode.
	eu	Enable recurring summer-time used in most parts of the European Union.
	usa	Enable recurring summer-time used in most parts of the USA.

9.1.5 clock summer-time recurring start

Edit the starting date and time for daylight saving time.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clock summer-time recurring start <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	none	
	first	
	second	
	third	
	fourth	
	last	

Parameter	Value	Meaning
P-2	none	
	sun	Sunday
	mon	Monday
	tue	Tuesday
	wed	Wednesday
	thu	Thursday
	fri	Friday
	sat	Saturday
P-3	none	
	jan	January
	feb	February
	mar	March
	apr	April
	may	May
	jun	June
	jul	July
	aug	August
	sep	September
	oct	October
	nov	November
	dec	December
P-4	string	<hh:mm> Present time in hh:mm format (00:00-23:59).

9.1.6 clock summer-time recurring end

Edit the ending date and time for daylight saving time.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: clock summer-time recurring end <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	none	
	first	
	second	
	third	
	fourth	
	last	
P-2	none	
	sun	Sunday
	mon	Monday
	tue	Tuesday
	wed	Wednesday
	thu	Thursday
	fri	Friday
	sat	Saturday
P-3	none	
	jan	January
	feb	February
	mar	March
	apr	April
	may	May
	jun	June
	jul	July
	aug	August
	sep	September
	oct	October
	nov	November
	dec	December
P-4	string	<hh:mm> Present time in hh:mm format (00:00-23:59).

9.1.7 clock summer-time zone

Edit timezone acronym for summer-time (max. 4 characters).

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: clock summer-time zone <P-1>

Parameter	Value	Meaning
P-1	string	Edit the timezone acronym (max 4 characters).

9.2 show

Display device options and settings.

9.2.1 show clock

Display the current time information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** `show clock [summer-time]`
[summer-time]: Display the summer-time parameters.

10 Configuration

10.1 save

Save the configuration to the specified destination.

10.1.1 save profile

Save the configuration to the specific profile.

- ▶ Mode: All Privileged Modes
- ▶ Privilege Level: Operator
- ▶ Format: save profile <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

10.2 config

Configure the configuration saving settings.

10.2.1 config watchdog admin-state

Enable or disable the configuration undo feature.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config watchdog admin-state

■ no config watchdog admin-state

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no config watchdog admin-state

10.2.2 config watchdog timeout

Configure the configuration undo timeout (unit: seconds).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config watchdog timeout <P-1>

Parameter	Value	Meaning
P-1	30..600	Enter a number in the given range.

10.2.3 config encryption password set

Set the configuration file password.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config encryption password set [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.
P-2	string	Enter a user-defined text, max. 64 characters.

10.2.4 config encryption password clear

Clear the configuration file password.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config encryption password clear [<P-1>]

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

10.2.5 config envm choose-active

Choose the active external non-volatile memory for copying firmware, logs, certificates etc. This does not affect loading and saving of the configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config envm choose-active <P-1>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device

10.2.6 config envm log-device

Choose the active external non-volatile memory for persistent log files.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config envm log-device <P-1>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device

10.2.7 config envm auto-update

Allow automatic firmware updates with this memory device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config envm auto-update <P-1>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device

- no config envm auto-update
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no config envm auto-update <P-1>

10.2.8 config envm sshkey-auto-update

Allow automatic ssh key updates with this memory device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config envm sshkey-auto-update <P-1>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device

- no config envm sshkey-auto-update
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no config envm sshkey-auto-update <P-1>

10.2.9 config envm config-save

Allow the configuration to be saved to this memory device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config envm config-save <P-1>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device

- no config envm config-save
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no config envm config-save <P-1>

10.2.10 config envm load-priority

Configure the order of configuration load attempts from memory devices at boot time. If one load is successful, then the device discards further attempts.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config envm load-priority <P-1> <P-2>

Parameter	Value	Meaning
P-1	sd	SD-Card
	usb	USB Storage Device
P-2	disable	Config will not be loaded at all
	first	Config will be loaded first. If successful, no other config will be tried.
	second	Config will be loaded if first one does not succeed.

10.2.11 config envm usb-compatibility

Changes the USB compatibility mode. The changes take effect only after saving the settings and rebooting the device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: config envm usb-compatibility <P-1>

Parameter	Value	Meaning
P-1	normal	Normal Mode
	compatibility	Compatibility Mode

- no config envm usb-compatibility
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no config envm usb-compatibility <P-1>

10.2.12 config profile select

Select a configuration profile to be the active configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config profile select <P-1> <P-2>

Parameter	Value	Meaning
P-1	nvm	You can only select nvm for this command.
P-2	1..20	Index of the profile entry.

10.2.13 config profile delete

Delete a specific configuration profile.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config profile delete <P-1> num <P-2> profile <P-3>

num: Select the index of a profile to delete.

profile: Select the name of a profile to delete.

Parameter	Value	Meaning
P-1	nvm	non-volatile memory
	envm	external non-volatile memory device
P-2	1..20	Index of the profile entry.
P-3	string	Enter a user-defined text, max. 32 characters.

10.2.14 config fingerprint verify nvm profile

Select the name of a profile to be verified.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config fingerprint verify nvm profile <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	Enter hash as 40 hexa-decimal characters.

10.2.15 config fingerprint verify nvm num

Select the index number of a profile to be verified.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config fingerprint verify nvm num <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..20	Index of the profile entry.
P-2	string	Enter hash as 40 hexa-decimal characters.

10.2.16 config fingerprint verify envm profile

Select the name of a profile to be verified.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config fingerprint verify envm profile <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	Enter hash as 40 hexa-decimal characters.

10.2.17 config fingerprint verify envm num

Select the index number of a profile to be verified.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config fingerprint verify envm num <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..20	Index of the profile entry.
P-2	string	Enter hash as 40 hexa-decimal characters.

10.2.18 config remote-backup operation

Enable or disable the remote backup of the configuration profile.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config remote-backup operation

■ no config remote-backup operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no config remote-backup operation

10.2.19 config remote-backup destination

Enter the destination URL for the configuration profile backup. The following wildcards are allowed: %d=date, %t=time, %i=IP address, %m=MAC address, %p=product name.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config remote-backup destination <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

10.2.20 config remote-backup username

Enter the user name to authenticate on the remote server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config remote-backup username <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

10.2.21 config remote-backup password

Enter the password to authenticate on the remote server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: config remote-backup password <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

10.3 copy

Copy different kinds of items.

10.3.1 copy sysinfo system envm

Copy the system information to external non-volatile memory.

► Mode: Privileged Exec Mode

► Privilege Level: Operator

► Format: copy sysinfo system envm [filename <P-1>]

[filename]: Enter the filename (format xyz.html) to be saved in external non-volatile memory.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

10.3.2 copy sysinfoall system envm

Copy the system information and the event log from the device to external non-volatile memory.

► Mode: Privileged Exec Mode

► Privilege Level: Operator

► Format: copy sysinfoall system envm

10.3.3 copy firmware envm

Copy a firmware image to the device from external non-volatile memory.

► Mode: Privileged Exec Mode

► Privilege Level: Administrator

► Format: copy firmware envm <P-1> system

system: Copy a firmware image to the device from external non-volatile memory.

Parameter	Value	Meaning
P-1	string	Filename.

10.3.4 copy firmware remote

Copy a firmware image to the device from a server.

► Mode: Privileged Exec Mode

► Privilege Level: Administrator

► Format: copy firmware remote <P-1> system [source-interface <P-2>]

system: Copy a firmware image to the device from a file server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

10.3.5 copy config running-config nvram

Copy the running-config to non-volatile memory.

► Mode: Privileged Exec Mode

► Privilege Level: Operator

► Format: copy config running-config nvram [profile <P-1>]

[profile]: Save the configuration as a specific profile name.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

10.3.6 copy config running-config remote

Copy the running-config to a file server.

► Mode: Privileged Exec Mode

► Privilege Level: Administrator

► Format: copy config running-config remote <P-1> [source-interface <P-2>]

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

10.3.7 copy config nvm

Load a configuration from non-volatile memory to the running-config.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy config nvm [profile <P-1>] running-config remote <P-2> [source-interface <P-3>]

[profile]: Load a configuration from a specific profile name.

running-config: (Re)-load a configuration from non-volatile memory to the running-config.

remote: Copy a configuration from non-volatile memory to a server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	Enter a user-defined text, max. 128 characters.
P-3	slot no./port no.	

10.3.8 copy config nvm running-config

(Re)-load a configuration from non-volatile memory to the running-config.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy config nvm running-config

10.3.9 copy config nvm remote

Copy a configuration from non-volatile memory to a server.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy config nvm remote <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

10.3.10 copy config envm

Copy a configuration from external non-volatile memory to non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy config envm [profile <P-1>] nvm

[profile]: Copy a specific configuration profile from external non-volatile memory to non-volatile memory.

nvm: Copy a specific profile from external non-volatile memory to non-volatile memory.

Parameter	Value	Meaning
P-1	string	Filename.

10.3.11 copy config remote

Copy a configuration file to the device from a server.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy config remote <P-1> nvm [profile <P-2>] [source-interface <P-3>] running-config [source-interface <P-4>]

nvm: Copy a configuration file from a server to non-volatile memory.

[profile]: Copy a configuration from a server to a specific profile in non-volatile memory.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

running-config: Copy a configuration file from a server to the running-config.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 32 characters.
P-3	slot no./port no.	
P-4	slot no./port no.	

10.3.12 copy sfp-white-list remote

Copy the SFP WhiteList from server to the device.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy sfp-white-list remote <P-1> nvm [source-interface <P-2>]

nvm: Copy the SFP WhiteList from server to the device.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

10.3.13 copy sfp-white-list envm

Copy the SFP WhiteList from external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy sfp-white-list envm <P-1> nvm

nvm: Copy the SFP WhiteList from external non-volatile memory to the device.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

10.4 clear

Clear several items.

10.4.1 clear config

Clear the running configuration.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear config [<P-1>]

Parameter	Value	Meaning
P-1	keep-ip	Keep the IP parameters for management at clear configuration.

10.4.2 clear factory

Set the device back to the factory settings (use with care).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear factory [erase-all]

[erase-all]: Set to factory settings and also erase file systems (use with extreme care).

10.4.3 clear sfp-white-list

Clear the SFP WhiteList.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear sfp-white-list

10.5 show

Display device options and settings.

10.5.1 show running-config xml

Display the currently running configuration (XML file).

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show running-config xml

10.5.2 show running-config script

Display the currently running configuration (CLI script).

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show running-config script [all]
[all]: Display the currently running configuration (CLI script).

10.6 show

Display device options and settings.

10.6.1 show config envm settings

Display the settings of the external non-volatile memory.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config envm settings

10.6.2 show config envm properties

Display the properties of the external non-volatile memory.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config envm properties

10.6.3 show config envm active

Display the active external non-volatile memory.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config envm active

10.6.4 show config envm usb-compatibility

Display the USB compatibility mode. The admin mode takes effect after saving the settings and rebooting the device.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config envm usb-compatibility

10.6.5 show config watchdog

Display the Auto Configuration Undo settings.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config watchdog

10.6.6 show config encryption

Display the settings for configuration encryption.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show config encryption

10.6.7 show config profiles

Display the configuration profiles.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show config profiles <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	nvm	non-volatile memory
	envm	external non-volatile memory device
P-2	1..20	Index of the profile entry.

10.6.8 show config status

Display the synchronization status of the running configuration with the non-volatile memory and the ACA.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show config status

10.6.9 show config remote-backup

Display the settings and the status for remote backup of the configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show config remote-backup

10.7 swap

Swap software images.

10.7.1 swap firmware system backup

Swap the main and backup images.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: swap firmware system backup

11 Dynamic ARP Inspection

11.1 ip

Set IP parameters.

11.1.1 ip arp-inspection verify src-mac

If enabled verifies the source MAC address in the ethernet packet against the sender MAC address in a ARP request/response packet body. If disabled does not perform this additional security check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `ip arp-inspection verify src-mac`
- no ip arp-inspection verify src-mac
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: `no ip arp-inspection verify src-mac`

11.1.2 ip arp-inspection verify dst-mac

If enabled verifies the destination MAC address in the (unicast) ethernet packet against the MAC address in a ARP response packet body. If disabled does not perform this additional security check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `ip arp-inspection verify dst-mac`
- no ip arp-inspection verify dst-mac
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: `no ip arp-inspection verify dst-mac`

11.1.3 ip arp-inspection verify ip

If enabled validates the sender protocol address (always) and the target protocol address (response) in the ARP packet body to be a public unicast IP address. Such addresses exclude 0.0.0.0, multicast/broadcast addresses, reserved addresses and loopback addresses. If disabled does not perform this additional security check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `ip arp-inspection verify ip`
- no ip arp-inspection verify ip
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: `no ip arp-inspection verify ip`

11.1.4 ip arp-inspection access-list add

This command creates a new ARP ACL (and optionally activates it).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `ip arp-inspection access-list add <P-1> [<P-2>]`

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.
P-2	active	Activate the option.
	inactive	Inactivate the option.

11.1.5 ip arp-inspection access-list delete

This command deletes an ARP ACL (and all rules associated with it).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list delete <P-1>

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.

11.1.6 ip arp-inspection access-list mode

This command activates or deactivates an ARP ACL.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list mode <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.
P-2	active	Activate the option.
	inactive	Inactivate the option.

11.1.7 ip arp-inspection access-list rule add

This command creates a new ARP ACL rule, associated with an ACL name and a MAC/IP address. Notice that the number of active ACL rules in an ACL is limited to 20.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list rule add <P-1> <P-2> <P-3> [<P-4>]

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.
P-2	aa:bb:cc:dd:ee:ff	MAC address.
P-3	A.B.C.D	IP address.
P-4	active	Activate the option.
	inactive	Inactivate the option.

11.1.8 ip arp-inspection access-list rule delete

This command deletes an ARP ACL rule, associated with a ACL name and MAC/IP address.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list rule delete <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.
P-2	aa:bb:cc:dd:ee:ff	MAC address.
P-3	A.B.C.D	IP address.

11.1.9 ip arp-inspection access-list rule mode

This command activates or deactivates a configured ARP ACL rule, associated with a ACL name and MAC/IP address.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list rule mode <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.
P-2	aa:bb:cc:dd:ee:ff	MAC address.
P-3	A.B.C.D	IP address.
P-4	active	Activate the option.
	inactive	Inactivate the option.

11.2 clear

Clear several items.

11.2.1 clear ip arp-inspection statistics

This command clears the Dynamic ARP Inspection (DAI) statistics on all VLANs.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear ip arp-inspection statistics

11.3 ip

IP commands.

11.3.1 ip arp-inspection mode

Enables or disables Dynamic ARP Inspection (DAI) on a VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection mode <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no ip arp-inspection mode
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection mode <P-1>

11.3.2 ip arp-inspection log

Enables or disables DAI logging on a VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection log <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no ip arp-inspection log
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection log <P-1>

11.3.3 ip arp-inspection bind-check

Enables or disables the DAI binding-check on a VLAN. If enabled, an ARP frame received on an untrusted port (in a DAI enabled VLAN) is checked. This test starts when a ARP ACL exists but the condition does not match in the rule table and the ACL strict flag is not set or when the ARP ACL not exist.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection bind-check <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no ip arp-inspection bind-check
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection bind-check <P-1>

11.3.4 ip arp-inspection access-list strict

Enables or disables the strict DAI ACL check on a VLAN. If an ARP ACL is defined for the VLAN and there is no match for the received ARP packet, then (if this option is enabled) the packet is dropped without consulting the DHCP Snooping bindings database.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list strict <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no ip arp-inspection access-list strict
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection access-list strict <P-1>

11.3.5 ip arp-inspection access-list assign

(Un) Configure the ARP ACL used to filter ARP packets on a VLAN. If the ARP ACL name is omitted, then no ACL is assigned to this VLAN. If the ARP ACL name does not exist in the ACL table, then it depends on the DHCP Snooping bindings database and/or it's configured usage whether an ARP packet is forwarded or dropped.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection access-list assign <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	<acl-name> Name of ACL.

11.4 ip

IP interface commands.

11.4.1 ip arp-inspection trust

This command configures an interface as trusted or untrusted. Dynamic ARP Inspection (DAI) forwards valid ARP packets on trusted interfaces without inspection. On un-trusted interfaces ARP packets will be subject to ARP inspection.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection trust

- no ip arp-inspection trust
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection trust

11.4.2 ip arp-inspection auto-disable

Enables or disables the auto-disable feature for an interface, applicable when the ARP packet rate exceeds the limit.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection auto-disable

- no ip arp-inspection auto-disable
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp-inspection auto-disable

11.4.3 ip arp-inspection limit

This command configures an interface for a maximum ARP packet rate in a burst interval, or disables it. If the rate of ARP packets exceed this limit in consecutive intervals then all further packets are dropped. If that happens and additionally the auto-disable feature is enabled, then the port is disabled automatically.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp-inspection limit <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	-1..300	Specifies the rate limit value (in packets per seconds, pps) for Dynamic ARP Inspection (DAI) purposes. The value -1 switches rate limiting off.

Parameter	Value	Meaning
P-2	1..15	Specifies the burst interval value for Dynamic ARP Inspection (DAI) purposes. Because this parameter is optional it leaves unchanged if omitted.

11.5 show

Display device options and settings.

11.5.1 show ip arp-inspection global

This command displays the global Dynamic ARP Inspection (DAI) configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection global`

11.5.2 show ip arp-inspection statistics dropped

This command lists statistics for ARP packets dropped by Dynamic ARP Inspection (DAI).

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection statistics dropped`

11.5.3 show ip arp-inspection statistics forwarded

This command lists statistics for ARP packets forwarded by Dynamic ARP Inspection (DAI).

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection statistics forwarded`

11.5.4 show ip arp-inspection access-list names

This command displays a list of all existing ARP ACLs.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection access-list names`

11.5.5 show ip arp-inspection access-list rules

This command displays all ACL rules of a dedicated ARP ACL.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection access-list rules <P-1>`

Parameter	Value	Meaning
P-1	string	<acl-name> Name of ACL.

11.5.6 show ip arp-inspection interfaces

This command shows the Dynamic ARP Inspection (DAI) status of all interfaces.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection interfaces`

11.5.7 show ip arp-inspection vlan

This command displays the VLAN based Dynamic ARP Inspection (DAI) status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip arp-inspection vlan`

12 Debugging

12.1 debug

Different tools to assist in debugging the device.

12.1.1 debug tcpdump help

Display the help file for the tcpdump tool.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump help

12.1.2 debug tcpdump start cpu

Start capture with default values.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump start cpu [filter <P-1>] [parms <P-2>]
[filter]: Start capture with values from a filter file.
[parms]: Start capture with the tcpdump parameters (for details see tcpdump help).

Parameter	Value	Meaning
P-1	string	<filename> Enter a valid filename.
P-2	string	Enter a user-defined text, max. 255 characters.

12.1.3 debug tcpdump stop

Abort capture of network traffic.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump stop

12.1.4 debug tcpdump filter show

Display a known filter file.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump filter show <P-1>

Parameter	Value	Meaning
P-1	string	<filename> Enter a valid filename.

12.1.5 debug tcpdump filter list

Display every available filter file.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump filter list

12.1.6 debug tcpdump filter delete

Delete a known filter file.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug tcpdump filter delete <P-1>

Parameter	Value	Meaning
P-1	string	<filename> Enter a valid filename.

12.1.7 debug stppkttrace

Packet tracer for spanning tree protocol.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: debug stppkttrace <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

12.2 show

Display device options and settings.

12.2.1 show debug developer-log

Show developer log

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: show debug developer-log [<P-1>]

Parameter	Value	Meaning
P-1	0..4294967294	Enter a number in the given range.

12.2.2 show debug logic-modules

List logic module information

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: show debug logic-modules

12.2.3 show debug stppkttrace

Display the mode of packet tracer for spanning tree protocol.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: show debug stppkttrace

12.3 copy

Copy different kinds of items.

12.3.1 copy tcpdumpcap nvm envm

Copy the capture file from non-volatile memory to external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy tcpdumpcap nvm envm [<P-1>]

Parameter	Value	Meaning
P-1	string	<filename> Enter a valid filename.

12.3.2 copy tcpdumpcap nvm remote

Copy the capture file from the device to a server.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy tcpdumpcap nvm remote <P-1> [source-interface <P-2>]
[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

12.3.3 copy tcpdumpfilter remote

Copy the filter file from a server to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy tcpdumpfilter remote <P-1> nvm <P-2> [source-interface <P-3>]
nvm: Copy the filter file from a server to non-volatile memory.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	<filename> Enter a valid filename.
P-3	slot no./port no.	

12.3.4 copy tcpdumpfilter envm

Copy the capture filter from external non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy tcpdumpfilter envm <P-1> nvm [<P-2>]

nvm: Copy the capture filter from external non-volatile memory to non-volatile memory.

Parameter	Value	Meaning
P-1	string	<filename> Enter a valid filename.
P-2	string	<filename> Enter a valid filename.

12.3.5 copy tcpdumpfilter nvm

Copy the capture filter from non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy tcpdumpfilter nvm <P-1> envm [<P-2>] remote <P-3> [source-interface <P-4>]

envm: Copy the capture filter from non-volatile memory to external non-volatile memory.

remote: Copy the capture file from non-volatile memory to a server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	<filename> Enter a valid filename.
P-3	string	Enter a user-defined text, max. 128 characters.
P-4	slot no./port no.	

13 Device Monitoring

13.1 device-status

Configure various device conditions to be monitored.

13.1.1 device-status monitor link-failure

Enable or disable monitor state of network connection(s).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor link-failure

■ no device-status monitor link-failure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no device-status monitor link-failure

13.1.2 device-status monitor temperature

Enable or disable monitoring of the device temperature.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor temperature

■ no device-status monitor temperature

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no device-status monitor temperature

13.1.3 device-status monitor module-removal

Enable or disable monitoring the presence of modules.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor module-removal

■ no device-status monitor module-removal

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no device-status monitor module-removal

13.1.4 device-status monitor fan-failure

Enable or disable monitoring the status of fan modules.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor fan-failure

■ no device-status monitor fan-failure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no device-status monitor fan-failure

13.1.5 device-status monitor envm-removal

Enable or disable monitoring the presence of the external non-volatile memory.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor envm-removal

- no device-status monitor envm-removal
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor envm-removal

13.1.6 device-status monitor envm-not-in-sync

Enable or disable monitoring synchronization between the external non-volatile memory and the running configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor envm-not-in-sync

- no device-status monitor envm-not-in-sync
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor envm-not-in-sync

13.1.7 device-status monitor ring-redundancy

Enable or disable monitoring if ring-redundancy is present.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor ring-redundancy

- no device-status monitor ring-redundancy
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor ring-redundancy

13.1.8 device-status monitor humidity

Enable or disable monitoring of the device humidity.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor humidity

- no device-status monitor humidity
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor humidity

13.1.9 device-status monitor power-supply

Enable or disable monitoring the condition of the power supply(s).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor power-supply <P-1>

Parameter	Value	Meaning
P-1	1..2	Number of power supply.

- no device-status monitor power-supply
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor power-supply <P-1>

13.1.10 device-status monitor stp-blocking

Enable or disable monitoring of ports blocked by STP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor stp-blocking

- no device-status monitor stp-blocking
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor stp-blocking

13.1.11 device-status monitor stp-blocking

Enable or disable monitoring of ports blocked by STP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status monitor stp-blocking

- no device-status monitor stp-blocking
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status monitor stp-blocking

13.1.12 device-status trap

Configure the device to send a trap when the device status changes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status trap

- no device-status trap
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status trap

13.1.13 device-status module

Configure the monitoring of the specific module.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status module <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

- no device-status module
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status module <P-1>

13.1.14 device-status fan-module

Configure the monitoring of the specific fan module.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: device-status fan-module <P-1>

Parameter	Value	Meaning
P-1	1..1	Number of fan modules.

- no device-status fan-module
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status fan-module <P-1>

13.2 device-status

Configure various device conditions to be monitored.

13.2.1 device-status link-alarm

Configure the monitor settings of the port link.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: device-status link-alarm
- no device-status link-alarm
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no device-status link-alarm

13.3 show

Display device options and settings.

13.3.1 show device-status monitor

Display the device monitoring configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status monitor

13.3.2 show device-status state

Display the current state of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status state

13.3.3 show device-status trap

Display the device trap information and configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status trap

13.3.4 show device-status events

Display occurred device status events.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status events

13.3.5 show device-status link-alarm

Display the monitor configurations of the network ports.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status link-alarm

13.3.6 show device-status module

Display the monitor configurations of the modules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status module

13.3.7 show device-status fan-module

Display the monitor configurations of the fan modules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status fan-module

13.3.8 show device-status all

Display the configurable device status settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show device-status all

14 Device Security

14.1 security-status

Configure the security status settings.

14.1.1 security-status monitor pwd-change

Sets the monitoring of default password change for 'user' and 'admin'.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pwd-change

■ no security-status monitor pwd-change

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pwd-change

14.1.2 security-status monitor pwd-min-length

Sets the monitoring of minimum length of the password (smaller 8).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pwd-min-length

■ no security-status monitor pwd-min-length

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pwd-min-length

14.1.3 security-status monitor pwd-policy-config

Sets the monitoring whether the minimum password policy is configured. The device changes the security status to the value "error" if the value for at least one of the following password rules is 0: "minimum upper cases", "minimum lower cases", "minimum numbers", "minimum special characters".

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pwd-policy-config

■ no security-status monitor pwd-policy-config

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pwd-policy-config

14.1.4 security-status monitor pwd-str-not-config

Sets the monitoring whether the password minimum strength check is configured.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pwd-str-not-config

■ no security-status monitor pwd-str-not-config

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pwd-str-not-config

14.1.5 security-status monitor pwd-policy-inactive

Sets the monitoring whether at least one user is configured with inactive policy check. The device changes the security status to the value "error" if the function "policy check" is inactive for at least 1 user account.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pwd-policy-inactive

■ no security-status monitor pwd-policy-inactive

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pwd-policy-inactive

14.1.6 security-status monitor bypass-pwd-strength

Sets the monitoring whether at least one user is configured to bypass strength check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor bypass-pwd-strength

■ no security-status monitor bypass-pwd-strength

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor bypass-pwd-strength

14.1.7 security-status monitor telnet-enabled

Sets the monitoring of the activation of telnet on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor telnet-enabled

■ no security-status monitor telnet-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor telnet-enabled

14.1.8 security-status monitor http-enabled

Sets the monitoring of the activation of http on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor http-enabled

■ no security-status monitor http-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor http-enabled

14.1.9 security-status monitor snmp-unsecure

Sets the monitoring of SNMP security (SNMP v1/v2 is enabled or v3 encryption is disabled).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor snmp-unsecure

■ no security-status monitor snmp-unsecure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor snmp-unsecure

14.1.10 security-status monitor snmp-unsecure

Sets the monitoring of SNMP security\n(SNMP v1/v2 is enabled or v3 encryption is disabled).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor snmp-unsecure

■ no security-status monitor snmp-unsecure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor snmp-unsecure

14.1.11 security-status monitor sysmon-enabled

Sets the monitoring of the activation of System Monitor 1 on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor sysmon-enabled

■ no security-status monitor sysmon-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor sysmon-enabled

14.1.12 security-status monitor extnvm-upd-enabled

Sets the monitoring of activation of the configuration saving to external non volatile memory.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor extnvm-upd-enabled

■ no security-status monitor extnvm-upd-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor extnvm-upd-enabled

14.1.13 security-status monitor no-link-enabled

Sets the monitoring of no link detection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor no-link-enabled

■ no security-status monitor no-link-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor no-link-enabled

14.1.14 security-status monitor hidisc-enabled

Sets the monitoring of HiDiscovery.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor hidisc-enabled

■ no security-status monitor hidisc-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor hidisc-enabled

14.1.15 security-status monitor extnvm-load-unsecure

Sets the monitoring of security of the configuration loading from extnvm.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor extnvm-load-unsecure

■ no security-status monitor extnvm-load-unsecure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor extnvm-load-unsecure

14.1.16 security-status monitor iec61850-mms-enabled

Sets the monitoring of the activation of IEC 61850 MMS on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor iec61850-mms-enabled

■ no security-status monitor iec61850-mms-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor iec61850-mms-enabled

14.1.17 security-status monitor https-certificate

Sets the monitoring whether auto generated self-signed HTTPS certificate is in use.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor https-certificate

■ no security-status monitor https-certificate

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor https-certificate

14.1.18 security-status monitor modbus-tcp-enabled

Sets the monitoring of the activation of Modbus/TCP server on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor modbus-tcp-enabled

■ no security-status monitor modbus-tcp-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor modbus-tcp-enabled

14.1.19 security-status monitor ethernet-ip-enabled

Sets the monitoring of the activation of EtherNet/IP protocol on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor ethernet-ip-enabled

■ no security-status monitor ethernet-ip-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor ethernet-ip-enabled

14.1.20 security-status monitor profinet-io-enabled

Sets the monitoring of the activation of PROFINET protocol on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor profinet-io-enabled

■ no security-status monitor profinet-io-enabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor profinet-io-enabled

14.1.21 security-status monitor pml-disabled

Sets the monitoring of the deactivation of Port MAC Locking service on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status monitor pml-disabled

■ no security-status monitor pml-disabled

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status monitor pml-disabled

14.1.22 security-status trap

Configure if a trap is sent when the security status changes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status trap

■ no security-status trap

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status trap

14.2 security-status

Configure the security status interface settings.

14.2.1 security-status no-link

Configure the monitoring of the specific ports.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: security-status no-link

■ no security-status no-link

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no security-status no-link

14.3 show

Display device options and settings.

14.3.1 show security-status monitor

Display the security status monitoring settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status monitor

14.3.2 show security-status state

Display the current security status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status state

14.3.3 show security-status no-link

Display the settings of the monitoring of the specific network ports.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status no-link

14.3.4 show security-status trap

Display the security status trap information and settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status trap

14.3.5 show security-status events

Display the occurred security status events.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status events

14.3.6 show security-status all

Display the security status settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show security-status all

15 Dynamic Host Configuration Protocol (DHCP)

15.1 dhcp-server

Modify DHCP Server parameters.

15.1.1 dhcp-server operation

Enable or disable the DHCP server on this port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server operation

■ no dhcp-server operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dhcp-server operation

15.2 dhcp-server

Modify DHCP Server parameters.

15.2.1 dhcp-server operation

Enable or disable the DHCP server globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server operation

■ no dhcp-server operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dhcp-server operation

15.2.2 dhcp-server addr-probe

Enable or disable the DHCP address probing.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server addr-probe

■ no dhcp-server addr-probe

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dhcp-server addr-probe

15.2.3 dhcp-server pool add

Add a pool

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server pool add <P-1> dynamic <P-2> <P-3> static <P-4>

dynamic: Add a pool with one or more IP addresses.

static: Add a pool with only one IP address. This is the same as the 'dynamic' command with last-ip set to '0.0.0.0'.

Parameter	Value	Meaning
P-1	1..128	Pool ID.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

Parameter	Value	Meaning
P-4	A.B.C.D	IP address.

15.2.4 dhcp-server pool modify

Modify the dynamic address pool

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dhcp-server pool modify <P-1> first-ip <P-2> last-ip <P-3> mode interface <P-4> mac <P-5> clientid <P-6> remoteid <P-7> circuitid <P-8> relay <P-9> vlan <P-10> leasetime <P-11> option configpath <P-12> gateway <P-13> netmask <P-14> wins <P-15> dns <P-16> hostname <P-17> hirschmann-device

first-ip: Modify the first IP.

last-ip: Modify the last IP.

mode: Pool mode settings.

interface: Interface mode.

mac: MAC mode.

clientid: Clientid mode.

remoteid: Remoteid mode.

circuitid: Circuitid mode.

relay: Relay mode.

vlan: VLAN mode.

leasetime: Enter the leasetime in seconds.

option: Configuration option.

configpath: Configpath in 'tftp://<servername>/<file>' format.

gateway: Default gateway.

netmask: Option netmask.

wins: Option wins.

dns: Option dns.

hostname: Option hostname.

hirschmann-device: Set this pool to Hirschmann devices only.

Parameter	Value	Meaning
P-1	1..128	Pool ID.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.
P-4	slot no./port no.	
P-5	none	Remove MAC mode.
	aa:bb:cc:dd:ee:ff	MAC address.
P-6	none	Remove ID mode.
	xx:xx:....xx	Enter ID in hexadecimal format.
P-7	none	Remove ID mode.
	xx:xx:....xx	Enter ID in hexadecimal format.
P-8	none	Remove ID mode.
	xx:xx:....xx	Enter ID in hexadecimal format.
P-9	none	Remove relay mode.
	ipaddr	Enter IP address of the relay.
P-10	-1..4042	VLAN ID. A value of -1 corresponds to management vlan (the default), any other value (1-4042) represents a specific VLAN
P-11	infinite	Infinite leasetime.
	60..220752000	Leasetime in seconds.
P-12	tftp://<servername>/<file>	tftp://<servername>/<file> Configuration path; empty string (") to clear value.
P-13	A.B.C.D	IP address.
P-14	A.B.C.D	IP address.
P-15	A.B.C.D	IP address.
P-16	A.B.C.D	IP address.
P-17	string	Enter a user-defined text, max. 64 characters.

■ no dhcp-server pool modify

Disable the option

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: no dhcp-server pool modify <P-1> first-ip last-ip mode interface mac clientid remoteid circuitid relay vlan leasetime option configpath gateway netmask wins dns hostname hirschmann-device

15.2.5 dhcp-server pool mode

Pool enable.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server pool mode <P-1>

Parameter	Value	Meaning
P-1	1..128	Pool ID.

■ no dhcp-server pool mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dhcp-server pool mode <P-1>

15.2.6 dhcp-server pool delete

Pool delete.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-server pool delete <P-1>

Parameter	Value	Meaning
P-1	1..128	Pool ID.

15.3 show

Display device options and settings.

15.3.1 show dhcp-server operation

Display the DHCP Server global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-server operation

15.3.2 show dhcp-server pool

Display the DHCP Server pool entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-server pool [<P-1>]

Parameter	Value	Meaning
P-1	1..128	Pool ID.

15.3.3 show dhcp-server interface

Display the DHCP server information per interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-server interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

15.3.4 show dhcp-server lease

Display the DHCP server lease entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-server lease

16 DHCP Layer 2 Relay

16.1 dhcp-l2relay

Configure DHCP Layer 2 Relay.

16.1.1 dhcp-l2relay mode

Enables or disables DHCP Layer 2 Relay globally.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: dhcp-l2relay mode
-
- no dhcp-l2relay mode
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dhcp-l2relay mode

16.2 dhcp-l2relay

Group of commands that configure DHCP Layer 2 Relay on existing VLANs.

16.2.1 dhcp-l2relay mode

Enables or disables DHCP Layer 2 Relay on a VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay mode <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no dhcp-l2relay mode
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dhcp-l2relay mode <P-1>

16.2.2 dhcp-l2relay circuit-id

This commands enables setting the Option 82 Circuit ID in DHCP messages to an interface descriptor.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay circuit-id <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no dhcp-l2relay circuit-id
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dhcp-l2relay circuit-id <P-1>

16.2.3 dhcp-l2relay remote-id ip

Specifies the IP address of device as DHCP Option 82 Remote ID.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay remote-id ip <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

16.2.4 dhcp-l2relay remote-id mac

Specifies the MAC address of device as DHCP Option 82 Remote ID.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay remote-id mac <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

16.2.5 dhcp-l2relay remote-id client-id

Specifies the system name of device as DHCP Option 82 Remote ID.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay remote-id client-id <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

16.2.6 dhcp-l2relay remote-id other

Allows you to specify the DHCP Option 82 Remote ID manually. If you omit the Remote ID, then only the Circuit ID is inserted into a relayed DHCP message.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: dhcp-l2relay remote-id other <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	<remote-id> Option 82 Remote ID

16.3 dhcp-l2relay

Configure DHCP Layer 2 Relay for an interface (list/range)

16.3.1 dhcp-l2relay mode

Enables or disables DHCP Layer 2 Relay on an interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: dhcp-l2relay mode
- no dhcp-l2relay mode
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dhcp-l2relay mode

16.3.2 dhcp-l2relay trust

This command configures an interface as trusted (typically connected to a DHCP server) or untrusted.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: dhcp-l2relay trust
- no dhcp-l2relay trust
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dhcp-l2relay trust

16.4 clear

Clear several items.

16.4.1 clear dhcp-l2relay statistics

This command clears the DHCP Layer 2 Relay statistics.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear dhcp-l2relay statistics

16.5 show

Display device options and settings.

16.5.1 show dhcp-l2relay global

This command displays the global DHCP Layer 2 Relay configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-l2relay global

16.5.2 show dhcp-l2relay statistics

This command displays interface statistics specific to DHCP Layer 2 Relay.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-l2relay statistics

16.5.3 show dhcp-l2relay interfaces

This command displays the DHCP Layer 2 Relay status of all interfaces.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-l2relay interfaces

16.5.4 show dhcp-l2relay vlan

This command displays the VLAN based DHCP Layer 2 Relay status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dhcp-l2relay vlan

17 DHCP Snooping

17.1 ip

Set IP parameters.

17.1.1 ip dhcp-snooping verify-mac

If enabled verifies the source MAC address in the ethernet packet against the client hardware address in the received DHCP Message. If disabled does not perform this additional security check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping verify-mac

■ no ip dhcp-snooping verify-mac

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip dhcp-snooping verify-mac

17.1.2 ip dhcp-snooping mode

Enable or disable DHCP Snooping.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping mode

■ no ip dhcp-snooping mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip dhcp-snooping mode

17.1.3 ip dhcp-snooping database storage

This command specifies a location for the persistent DHCP Snooping bindings database. This can be a local file or a remote file on a given host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping database storage <P-1>

Parameter	Value	Meaning
P-1	local	Save persistent DHCP Snooping bindings database to a local file.
	tftp-loc	Save persistent DHCP Snooping bindings database to a remote file: <tftp-loc> := tftp://<ip-addr>/<filename>.

17.1.4 ip dhcp-snooping database write-delay

This command configures the interval in seconds at which the DHCP Snooping binding database will be saved (persistent).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping database write-delay <P-1>

Parameter	Value	Meaning
P-1	15..86400	Interval in seconds at which the persistent DHCP Snooping binding database will be saved. The interval value ranges from 15 to 86400 seconds.

17.1.5 ip dhcp-snooping binding add

This command creates a new static DHCP Snooping binding (and optionally an associated dynamic IP Source Guard binding) between a MAC address and an IP address, for a specific VLAN at a particular interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping binding add <P-1> <P-2> <P-3> <P-4> [<P-5>]

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.

Parameter	Value	Meaning
P-2	A.B.C.D	IP address.
P-3	slot no./port no.	
P-4	1..4042	Enter the VLAN ID.
P-5	active	Activate the option.
	inactive	Inactivate the option.

17.1.6 ip dhcp-snooping binding delete all

This command deletes all static DHCP Snooping bindings (and optionally all associated dynamic IP Source Guard bindings) at all interfaces.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping binding delete all

17.1.7 ip dhcp-snooping binding delete interface

This command deletes all static DHCP Snooping bindings (and optionally all associated dynamic IP Source Guard bindings), associated with a particular interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping binding delete interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

17.1.8 ip dhcp-snooping binding delete mac

This command deletes one DHCP Snooping binding (and optionally the associated dynamic IP Source Guard binding), associated with a MAC address.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping binding delete mac <P-1>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.

17.1.9 ip dhcp-snooping binding mode

This command activates or deactivates a configured static DHCP Snooping binding, associated with a MAC address.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping binding mode <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	active	Activate the option.
	inactive	Inactivate the option.

17.2 clear

Clear several items.

17.2.1 clear ip dhcp-snooping bindings

This command clears all dynamic DHCP Snooping (and IP Source Guard) bindings on all interfaces or on a specific interface.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear ip dhcp-snooping bindings [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

17.2.2 clear ip dhcp-snooping statistics

This command clears the DHCP Snooping statistics.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear ip dhcp-snooping statistics

17.3 ip

IP commands.

17.3.1 ip dhcp-snooping mode

Enables or disables DHCP Snooping on a VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping mode <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

- no ip dhcp-snooping mode
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dhcp-snooping mode <P-1>

17.4 ip

IP interface commands.

17.4.1 ip dhcp-snooping trust

This command configures an interface as trusted (typically connected to a DHCP server) or un-trusted. DHCP Snooping forwards valid DHCP client messages on trusted interfaces. On un-trusted interfaces the application compares the receive interface with the clients interface in the binding database.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping trust

- no ip dhcp-snooping trust
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dhcp-snooping trust

17.4.2 ip dhcp-snooping log

This command configures an interface to log invalid DHCP messages, or not to log.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping log

- no ip dhcp-snooping log
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dhcp-snooping log

17.4.3 ip dhcp-snooping auto-disable

Enables or disables the auto-disable feature for an interface, applicable when the DHCP packet rate exceeds the limit.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping auto-disable

- no ip dhcp-snooping auto-disable
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dhcp-snooping auto-disable

17.4.4 ip dhcp-snooping limit

This command configures an interface for a maximum DHCP packet rate in a burst interval, or disables it. If the rate of DHCP packets exceed this limit in consecutive intervals then all further packets are dropped. If that happens and additionally the auto-disable feature is enabled, then the port is disabled automatically.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dhcp-snooping limit <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	-1..150	Specifies the rate limit value (in packets per seconds, pps) for DHCP snooping purposes. The value -1 switches rate limiting off.
P-2	1..15	Specifies the burst interval value for DHCP snooping purposes. Because this parameter is optional it leaves unchanged if omitted.

17.5 show

Display device options and settings.

17.5.1 show ip dhcp-snooping global

This command displays the global DHCP Snooping configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dhcp-snooping global

17.5.2 show ip dhcp-snooping statistics

This command displays statistics for DHCP Snooping security violations on untrusted ports.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dhcp-snooping statistics

17.5.3 show ip dhcp-snooping interfaces

This command shows the DHCP Snooping status of all interfaces.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dhcp-snooping interfaces

17.5.4 show ip dhcp-snooping vlan

This command displays the VLAN based DHCP Snooping status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dhcp-snooping vlan

17.5.5 show ip dhcp-snooping bindings

This command displays the DHCP Snooping binding entries from the static and/or dynamic bindings table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dhcp-snooping bindings [<P-1>] [interface <P-2>] [vlan <P-3>]
[interface]: Restrict the output based on a specific interface.
[vlan]: Restrict the output based on VLAN.

Parameter	Value	Meaning
P-1	static	Restrict the output based on static bindings.
	dynamic	Restrict the output based on dynamic bindings.
P-2	slot no./port no.	
P-3	1..4042	Enter the VLAN ID.

18 Differentiated Services (DiffServ)

18.1 diffserv

18.1.1 diffserv

Enable or disable DiffServ.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: diffserv

■ no diffserv

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no diffserv

18.2 class-map

Manage DiffServ classes.

18.2.1 class-map match-all

Create a new match-all class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map match-all <P-1>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.

18.2.2 class-map name match any

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match any

match: Add a match rule for the class.

any: Match any packet.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.

18.2.3 class-map name match class-map

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match class-map <P-2> <P-3>

match: Add a match rule for the class.

class-map: Add/remove a set of match condition defined for another class.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	enable	Enable the option.
	disable	Disable the option.

18.2.4 class-map name match cos

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match cos <P-2>

match: Add a match rule for the class.

cos: Add a match condition based on the COS value.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	0..7	COS value.

18.2.5 class-map name match destination-address

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match destination-address <P-2> <P-3> <P-4>

match: Add a match rule for the class.

destination-address: Add a match condition based on the destination mac address.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	mac	mac.
P-3	aa:bb:cc:dd:ee:ff	MAC address.
P-4	aa:bb:cc:dd:ee:ff	MAC mask.

18.2.6 class-map name match dstip

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match dstip <P-2> <P-3>

match: Add a match rule for the class.

dstip: Add a match condition based on the destination IPv4 address.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	a.b.c.d	IP address.
P-3	a.b.c.d	IP subnet mask.

18.2.7 class-map name match dst14port

Configure a Diffserv class.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: class-map name <P-1> match dst14port <P-2>

match: Add a match rule for the class.

dst14port: Add a match condition based on the layer 4 destination port.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	domain	domain
	echo	echo
	ftp	ftp
	ftpdata	ftpdata
	http	http
	smtp	smtp
	snmp	snmp
	telnet	telnet
	tftp	tftp
	www	www
	0-65535	Port number

18.2.8 class-map name match ethertype

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match ethertype <P-2>

match: Add a match rule for the class.

ethertype: Add a match condition based on the ethertype value.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	0x0600-0xffff	ethertype
	appletalk	appletalk
	arp	arp
	ibmsna	ibmsna
	ipv4	ipv4
	ipv6	ipv6
	ipx	ipx
	mplsmcast	mplsmcast
	mplsucast	mplsucast
	netbios	netbios
	novell	novell
	pppoe	pppoe
	rarp	rarp

18.2.9 class-map name match ip dscp

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match ip dscp <P-2>

match: Add a match rule for the class.

ip: Add a match condition based on IP DSCP, precedence or TOS fields.

dscp: Add a match condition based on the IP DSCP field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	0-63	Decimal value
	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef

18.2.10 class-map name match ip precedence

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match ip precedence <P-2>

match: Add a match rule for the class.

ip: Add a match condition based on IP DSCP, precedence or TOS fields.

precedence: Add a match condition based on the IP precedence field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	0..7	Ip precedence value.

18.2.11 class-map name match ip tos

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match ip tos <P-2> <P-3>

match: Add a match rule for the class.

ip: Add a match condition based on IP DSCP, precedence or TOS fields.

tos: Add a match condition based on the IP TOS field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	00-ff	Tos bits/mask.
P-3	00-ff	Tos bits/mask.

18.2.12 class-map name match protocol

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match protocol <P-2>

match: Add a match rule for the class.

protocol: Add a match condition based on the IP protocol field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	icmp	icmp
	igmp	igmp
	ip	ip
	tcp	tcp
	udp	udp
	0-255	Protocol number

18.2.13 class-map name match secondary-cos

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match secondary-cos <P-2>

match: Add a match rule for the class.

secondary-cos: Add a match condition based on the secondary COS value.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	0..7	COS value.

18.2.14 class-map name match secondary-vlan

Configure a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map name <P-1> match secondary-vlan <P-2>

match: Add a match rule for the class.

secondary-vlan: Add a match condition based on the secondary VLAN field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	1..4042	Enter the VLAN ID.

18.2.15 class-map name match source-address

Configure a Diffserv class.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: class-map name <P-1> match source-address <P-2> <P-3> <P-4>

match: Add a match rule for the class.

source-address: Add a match condition based on the source mac address.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	mac	mac.
P-3	aa:bb:cc:dd:ee:ff	MAC address.
P-4	aa:bb:cc:dd:ee:ff	MAC mask.

18.2.16 class-map name match srcip

Configure a Diffserv class.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: class-map name <P-1> match srcip <P-2> <P-3>

match: Add a match rule for the class.

srcip: Add a match condition based on the source IP address.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	a.b.c.d	IP address.
P-3	a.b.c.d	IP subnet mask.

18.2.17 class-map name match src14port

Configure a Diffserv class.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: class-map name <P-1> match src14port <P-2>

match: Add a match rule for the class.

src14port: Add a match condition based on the layer 4 source port.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	domain	domain
	echo	echo
	ftp	ftp
	ftpdata	ftpdata
	http	http
	smtp	smtp
	snmp	snmp
	telnet	telnet
	tftp	tftp
	www	www
	0-65535	Port number

18.2.18 class-map name match vlan

Configure a Diffserv class.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: class-map name <P-1> match vlan <P-2>

match: Add a match rule for the class.

vlan: Add a match condition based on the VLAN field.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	1..4042	Enter the VLAN ID.

18.2.19 class-map remove

Remove a Diffserv class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map remove <P-1>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.

18.2.20 class-map rename

Rename an existing class.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map rename <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.

18.3 policy-map

Manage DiffServ policies.

18.3.1 policy-map create

Create a DiffServ policy.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: policy-map create <P-1> { in | out }

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	in	Traffic direction in.
P-2	out	Traffic direction out.

18.3.2 policy-map name class add

Configure a Diffserv policy.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: policy-map name <string> class add <string>
- class: Manage DiffServ policy-class instances.
add: Add a policy-class instance.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.

18.3.3 policy-map name class name assign-queue

Configure a Diffserv policy.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: policy-map name <string> class name <string> assign-queue <0..7>
- class: Manage DiffServ policy-class instances.
name: Configure a policy-class instance.
assign-queue: Modify the queue id to which the associated traffic stream is assigned.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	0..7	Assign queue id.

18.3.4 policy-map name class name conform-color

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string> conform-color <string>

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

conform-color: Enable color-aware traffic policing and define the conform-color class.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	string	Enter the DiffServ class name, max. 31 characters.

18.3.5 policy-map name class name drop

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string> drop

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

drop: All packets for the associated traffic stream are dropped at ingress.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.

18.3.6 policy-map name class name mark

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string>

```
mark {cos <0..7> |
      cos-as-sec-cos |
      ip-dscp <af11|af12|af13|af21|af22|
              af23|af31|af32|af33|af41|
              af42|af43|be|cs0|cs1|cs2|
              cs3|cs4|cs5|cs6|cs7|ef> |
      ip-precedence <0..7>}
```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

mark: Add a mark attribute.

cos: Marks all packets with the specified COS value.

cos-as-sec-cos: Use secondary COS as COS.

ip-dscp: Marks all packets with the specified IP DSCP value.

ip-precedence: Marks all packets with the specified IP precedence value.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	0..7	COS value.

Parameter	Value	Meaning
P-4	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-5	0..7	Ip precedence value.

18.3.7 policy-map name class name mirror

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string>

```
mirror < 1/1 | 1/2 | 1/3 | 1/4 | 2/1 |
          2/2 | 2/3 | 2/4 | 3/1 | 3/2 |
          3/3 | 3/4 | 4/1 | 4/2 | 4/3 |
          4/4 | 5/1 | 5/2 | 5/3 | 5/4 >
```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

mirror: All incoming packets for the associated traffic stream are copied to a specific egress interface.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1/1	slot 1 / port 1
	1/2	slot 1 / port 2
	1/3	slot 1 / port 3
	1/4	slot 1 / port 4
	2/1	slot 2 / port 1
	2/2	slot 2 / port 2
	2/3	slot 2 / port 3
	2/4	slot 2 / port 4
	3/1	slot 3 / port 1
	3/2	slot 3 / port 2
	3/3	slot 3 / port 3
	3/4	slot 3 / port 4
	4/1	slot 4 / port 1
	4/2	slot 4 / port 2
	4/3	slot 4 / port 3
	4/4	slot 4 / port 4
	5/1	slot 5 / port 1
	5/2	slot 5 / port 2
	5/3	slot 5 / port 3
	5/4	slot 5 / port 4
	lag/1	lag instance 1
	lag/2	lag instance 2

18.3.8 policy-map name class name police-simple conform action drop violate-action

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string>
 police-simple
 < 1..4294967295> <1..128> conform-action
 drop violate-action
 {drop |
 set-cos-as-sec-cos |
 set-cos-transmit <0..7> |
 set-dscp-transmit
 <af11|af12|af13|af21|af22|
 af23|af31|af32|af33|af41|
 af42|af43|be|cs0|cs1|cs2|
 cs3|cs4|cs5|cs6|cs7|ef> |
 set-prec-transmit <0..7> |
 set-sec-cos-transmit <0..7> |
 transmit}

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	0..7	COS value.
P-6	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-7	0..7	Ip precedence value.
P-8	0..7	COS value.

18.3.9 policy-map name class name police-simple conform action set-cos-as-sec-cos violate-action

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string>

```
police-simple <1..4294967295> <1..128>
  conform-action set-cos-as-sec-cos
  violate-action
    {drop |
      set-cos-as-sec-cos |
      set-cos-transmit <0..7> |
      set-dscp-transmit
        <af11|af12|af13|af21|af22|
        af23|af31|af32|af33|af41|
        af42|af43|be|cs0|cs1|cs2|
        cs3|cs4|cs5|cs6|cs7|ef> |
      set-prec-transmit <0..7> |
      set-sec-cos-transmit <0..7> |
      transmit}
```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	0..7	COS value.
P-6	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-7	0..7	Ip precedence value.
P-8	0..7	COS value.

18.3.10 policy-map name class name police-simple conform action set-cos-transmit violate-action

Configure a Diffserv policy.

```
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: policy-map name <string> class name <string>
        police-simple <1..4294967295> <1..128>
            conform-action set-cos-transmit <0..7>
            violate-action
                {drop |
                 set-cos-as-sec-cos |
                 set-cos-transmit <0..7> |
                 set-dscp-transmit
                 <af11|af12|af13|af21|af22|
                 af23|af31|af32|af33|af41|
                 af42|af43|be|cs0|cs1|cs2|
                 cs3|cs4|cs5|cs6|cs7|ef> |
                 set-prec-transmit <0..7> |
                 set-sec-cos-transmit <0..7> |
                 transmit}
```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	0..7	COS value.
P-6	0..7	COS value.
P-7	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-8	0..7	Ip precedence value.
P-9	0..7	COS value.

18.3.11 policy-map name class name police-simple conform action set-dscp-transmit violate-action

Configure a Diffserv policy.

► **Mode:** Global Config Mode

► **Privilege Level:** Operator

► **Format:** policy-map name <string> class name <string>

```

    police-simple <1..4294967295> <1..128>
        conform-action set-dscp-transmit
            <af11|af12|af13|af21|af22|
            af23|af31|af32|af33|af41|
            af42|af43|be|cs0|cs1|cs2|
            cs3|cs4|cs5|cs6|cs7|ef>
        violate-action
            {drop |
            set-cos-as-sec-cos |
            set-cos-transmit <0..7> |
            set-dscp-transmit
                <af11|af12|af13|af21|af22|
                af23|af31|af32|af33|af41|
                af42|af43|be|cs0|cs1|cs2|
                cs3|cs4|cs5|cs6|cs7|ef> |
            set-prec-transmit <0..7> |
            set-sec-cos-transmit <0..7> |
            transmit}

```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef

Parameter	Value	Meaning
P-6	0..7	COS value.
P-7	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-8	0..7	Ip precedence value.
P-9	0..7	COS value.

18.3.12 policy-map name class name police-simple conform action set-prec-transmit violate-action

Configure a Diffserv policy.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: policy-map name <string> class name <string>
 police-simple <1..4294967295> <1..128>
 conform-action set-prec-transmit <0..7>
 violate-action
 {drop |
 set-cos-as-sec-cos |
 set-cos-transmit <0..7> |
 set-dscp-transmit
 <af11|af12|af13|af21|af22|
 af23|af31|af32|af33|af41|
 af42|af43|be|cs0|cs1|cs2|
 cs3|cs4|cs5|cs6|cs7|ef> |
 set-prec-transmit <0..7> |
 set-sec-cos-transmit <0..7> |
 transmit}

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).

Parameter	Value	Meaning
P-4	1..128	Burst size (KB).
P-5	0..7	Ip precedence value..
P-6	0..7	COS value.
P-7	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-8	0..7	Ip precedence value.
P-9	0..7	COS value.

18.3.13 policy-map name class name police-simple conform action set-sec-cos-transmit violate-action

Configure a Diffserv policy.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: policy-map name <string> class name <string>
 police-simple <1..4294967295> <1..128>
 conform-action set-sec-cos-transmit <0..7>
 violate-action
 {drop |
 set-cos-as-sec-cos |
 set-cos-transmit <0..7> |
 set-dscp-transmit
 <af11|af12|af13|af21|af22|
 af23|af31|af32|af33|af41|
 af42|af43|be|cs0|cs1|cs2|
 cs3|cs4|cs5|cs6|cs7|ef> |
 set-prec-transmit <0..7> |
 set-sec-cos-transmit <0..7> |
 transmit}

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.

Parameter	Value	Meaning
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	0..7	COS value.
P-6	0..7	COS value.
P-7	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-8	0..7	Ip precedence value.
P-9	0..7	COS value.

18.3.14 policy-map name class name police-simple conform action transmit violate-action

Configure a Diffserv policy.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: policy-map name <string> class name <string>
 police-simple <1..4294967295> <1..128>
 conform-action transmit violate-action
 {drop |
 set-cos-as-sec-cos |
 set-cos-transmit <0..7> |
 set-dscp-transmit
 <af11|af12|af13|af21|af22|
 af23|af31|af32|af33|af41|
 af42|af43|be|cs0|cs1|cs2|
 cs3|cs4|cs5|cs6|cs7|ef> |
 set-prec-transmit <0..7> |
 set-sec-cos-transmit <0..7> |
 transmit}

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-simple: Establish the traffic policing style for the specified class.

conform-action: Conform action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.

Parameter	Value	Meaning
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	0..7	COS value.
P-6	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-7	0..7	Ip precedence value.
P-8	0..7	COS value.

18.3.15 policy-map name class name police-two-rate conform-action ... exceed-action ... violate-action ...

Configure a Diffserv policy.

```

> Mode: Global Config Mode
> Privilege Level: Operator
> Format: policy-map name <string> class name <string>
        police-two-rate <1..4294967295> <1..128>
            <1..4294967295> <1..128>
            conform-action *)
            exceed-action *)
            violate-action *)

        *){drop |
            set-cos-as-sec-cos |
            set-cos-transmit <0..7> |
            set-dscp-transmit
                <af11|af12|af13|af21|af22|
                af23|af31|af32|af33|af41|
                af42|af43|be|cs0|cs1|cs2|
                cs3|cs4|cs5|cs6|cs7|ef> |
            set-prec-transmit <0..7> |
            set-sec-cos-transmit <0..7> |
            transmit}

```

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

police-two-rate: Establish the two-rate traffic policing style for the specified class.

conform-action: Conform action.

exceed-action: Exceed action.

violate-action: Violate action.

drop: Drop.

set-cos-as-sec-cos: set-cos-as-sec-cos

set-cos-transmit: set-cos-transmit

set-sec-cos-transmit: set-sec-cos-transmit

set-prec-transmit: set-prec-transmit

set-dscp-transmit: set-dscp-transmit

transmit: transmit

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.
P-3	1..4294967295	Data rate (Kbps).
P-4	1..128	Burst size (KB).
P-5	1..4294967295	Data rate (Kbps).
P-6	1..128	Burst size (KB).
P-7	0..7	COS value.
P-8	af11	af11
	af12	af12
	af13	af13
	af21	af21
	af22	af22
	af23	af23
	af31	af31
	af32	af32
	af33	af33
	af41	af41
	af42	af42
	af43	af43
	be	be
	cs0	cs0
	cs1	cs1
	cs2	cs2
	cs3	cs3
	cs4	cs4
	cs5	cs5
	cs6	cs6
	cs7	cs7
	ef	ef
P-9	0..7	Ip precedence value.
P-10	0..7	COS value.

18.3.16 policy-map name class name redirect

Configure a Diffserv policy.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: policy-map name <string> class name <string>
 redirect < 1/1 | 1/2 | 1/3 | 1/4 | 2/1 |
 2/2 | 2/3 | 2/4 | 3/1 | 3/2 |
 3/3 | 3/4 | 4/1 | 4/2 | 4/3 |
 4/4 | 5/1 | 5/2 | 5/3 | 5/4 |
 lag/1 | lag/2 >

class: Manage DiffServ policy-class instances.

name: Configure a policy-class instance.

redirect: All incoming packets for the associated traffic stream are redirected to a specific egress interface.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.

Parameter	Value	Meaning
P-3	1/1	slot 1 / port 1
	1/2	slot 1 / port 2
	1/3	slot 1 / port 3
	1/4	slot 1 / port 4
	2/1	slot 2 / port 1
	2/2	slot 2 / port 2
	2/3	slot 2 / port 3
	2/4	slot 2 / port 4
	3/1	slot 3 / port 1
	3/2	slot 3 / port 2
	3/3	slot 3 / port 3
	3/4	slot 3 / port 4
	4/1	slot 4 / port 1
	4/2	slot 4 / port 2
	4/3	slot 4 / port 3
	4/4	slot 4 / port 4
	5/1	slot 5 / port 1
	5/2	slot 5 / port 2
	5/3	slot 5 / port 3
	5/4	slot 5 / port 4
	lag/1	lag instance 1
	lag/1	lag instance 1

18.3.17 policy-map name class remove

Configure a Diffserv policy.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: policy-map name <string> class remove <string>
- class: Manage DiffServ policy-class instances.
remove: Remove a policy-class instance.

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ class name, max. 31 characters.

18.3.18 policy-map rename

Rename an existing DiffServ policy.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: policy-map rename <string> <string>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.
P-2	string	Enter the DiffServ policy name, max. 31 characters.

18.3.19 policy-map remove

Remove a Diffserv policy.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: policy-map remove <string>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.

18.4 service-policy

18.4.1 service-policy

Assign/detach a DiffServ traffic conditioning policy to/from all interfaces.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: service-policy <P-1> <P-2>

Parameter	Value	Meaning
P-1	in	Traffic direction in
	out	Traffic direction out
P-2	string	Enter the DiffServ policy name, max. 31 characters.

- no service-policy
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no service-policy <P-1> <P-2>

18.5 service-policy

18.5.1 service-policy

Assign/detach a DiffServ traffic conditioning policy to/from an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: service-policy <P-1> <P-2>

Parameter	Value	Meaning
P-1	in	Traffic direction in
	out	Traffic direction out
P-2	string	Enter the DiffServ policy name, max. 31 characters.

- no service-policy
 - Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no service-policy <P-1> <P-2>

18.6 show

Display device options and settings.

18.6.1 show diffserv global

Display the DiffServ global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show diffserv global

18.6.2 show diffserv service brief

Display the DiffServ policy summary information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show diffserv service brief

18.6.3 show diffserv service interface

Display the DiffServ policy service information for the specified interface and direction.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show diffserv service interface <P-1> <P-2>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	in	Traffic direction in
	out	Traffic direction out

18.6.4 show class-map

Display the existing DiffServ classes or display the information for a specified class.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show class-map [<P-1>]

Parameter	Value	Meaning
P-1	string	Enter the DiffServ class name, max. 31 characters.

18.6.5 show policy-map all

Display every Diffserv policy.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show policy-map all

18.6.6 show policy-map interface

Display the policies attached to the specified interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show policy-map interface <P-1> <P-2>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	in	Traffic direction in
	out	Traffic direction out

18.6.7 show policy-map name

Display the information for the specified policy.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show policy-map name <P-1>

Parameter	Value	Meaning
P-1	string	Enter the DiffServ policy name, max. 31 characters.

18.6.8 show service-policy

Display a summary of policy-oriented statistics information for every interface in the specified direction.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show service-policy <P-1>

Parameter	Value	Meaning
P-1	in	Traffic direction in
	out	Traffic direction out

19 Device Level Ring (DLR)

19.1 dlr

Set the DLR parameters.

19.1.1 dlr operation

Enable or disable the Device Level Ring globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dlr operation

■ no dlr operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dlr operation

19.1.2 dlr ring add

Create a Device Level Ring. The DLR ring will consist of default parameters and its operation will be disabled.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dlr ring add <P-1> [port-1 <P-2>] [port-2 <P-3>] [name <P-4>] [supervisor <P-5>] [precedence <P-6>] [vlan <P-7>] [beacon-interval <P-8>] [beacon-timeout <P-9>]

[port-1]: Configure the DLR ring port 1.

[port-2]: Configure the DLR ring port 2.

[name]: Configure the name of the DLR ring.

[supervisor]: Enable or disable the supervisor mode.

[precedence]: Configure the supervisor precedence.

[vlan]: Configure the VLAN identifier to use in the DLR protocol messages.

[beacon-interval]: Configure the beacon interval in microseconds (default: 400).

[beacon-timeout]: Configure the beacon timeout in microseconds (default: 1960).

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	slot no./port no.	
P-3	slot no./port no.	
P-4	string	Enter a user-defined text, max. 255 characters.
P-5	enable	Enable the option.
	disable	Disable the option.
P-6	0..255	The DLR supervisor precedence (default: 0).
P-7	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.
P-8	400..100000	The DLR beacon interval time in microseconds (default: 400).
P-9	1600..500000	The DLR beacon timeout in microseconds (default: 1960).

19.1.3 dlr ring delete

Delete the Device Level Ring.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dlr ring delete <P-1>

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.

19.1.4 dlr ring modify

Modify the DLR ring settings.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dlr ring modify <P-1> operation <P-2> supervisor <P-3> precedence <P-4> name <P-5> port-1 <P-6> port-2 <P-7> beacon interval <P-8> timeout <P-9> vlan <P-10> service <P-11>

operation: Enable or disable the Device Level Ring for the specified ring ID.

supervisor: Enable or disable the supervisor mode.
precedence: Configure the supervisor precedence.
name: Configure the name of the DLR ring.
port-1: Configure the DLR ring ports.
port-2: Configure the DLR ring ports.
beacon: Configure the beacon interval or the beacon timeout in microseconds.
interval: Configure the beacon interval in microseconds (default: 400).
timeout: Configure the beacon timeout in microseconds (default: 1960).
vlan: Configure the VLAN identifier to use in the DLR protocol messages.
service: Initiates a service on the supervisor node.

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	enable	Enable the option.
	disable	Disable the option.
P-3	enable	Enable the option.
	disable	Disable the option.
P-4	0..255	The DLR supervisor precedence (default: 0).
P-5	string	Enter a user-defined text, max. 255 characters.
P-6	slot no./port no.	
P-7	slot no./port no.	
P-8	400..100000	The DLR beacon interval time in microseconds (default: 400).
P-9	1600..500000	The DLR beacon timeout in microseconds (default: 1960).
P-10	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.
P-11	fault-location	Verify the fault location.
	clear-rapid-fault	Clear rapid faults.
	restart-sign-on	Restart the Sign On process and refresh the participants list.
	clear-gateway-fault	Clear partial network fault condition in the gateway. The function is only available if the device is capable of being a gateway, and you enable the gateway for the specified ring.

19.1.5 dlr gateway

Configure the Device Level Ring gateway(s).

► Mode: Global Config Mode
► Privilege Level: Operator
► Format: dlr gateway <P-1> operation add <P-2> delete <P-3> modify <P-4> name <P-5> learning-update precedence <P-6> advertise interval <P-7> timeout <P-8> uplink-primary <P-9> uplink-secondary <P-10>
operation: Enable or disable the Device Level Ring Gateway for the specified gateway ID.
add: Create a Device Level Ring gateway with a specific gateway ID.
Initially the DLR gateway has the default parameters assigned, and the function is disabled.
Configure a unique gateway ID on the device.
The DLR gateway is then added to the specified ring ID.
delete: Delete the Device Level Ring Gateway.
modify: Modify the DLR gateway settings.
name: Configure the name of the DLR gateway.
learning-update: Enable or disable the DLR gateway learning update.
precedence: Configure the precedence of the DLR gateway.
advertise: Configure the advertise interval or advertise timeout in microseconds.
interval: Configure the advertise interval in microseconds (default: 2000).
timeout: Configure the advertise timeout in microseconds (default: 5000).
uplink-primary: Configure the DLR gateway uplink ports.
uplink-secondary: Configure the DLR gateway uplink ports.

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	1..255	The DLR gateway ID.
P-3	1..255	The DLR gateway ID.
P-4	1..255	The DLR gateway ID.
P-5	string	Enter a user-defined text, max. 256 characters.
P-6	0..255	The DLR gateway precedence.
P-7	1000..100000	The DLR gateway advertise interval in microseconds.
P-8	2500..500000	The DLR gateway advertise timeout in microseconds.
P-9	slot no./port no.	
P-10	slot no./port no.	

- no dlr gateway
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dlr gateway operation add delete modify name learning-update precedence advertise interval timeout uplink-primary uplink-secondary

19.2 show

Display device options and settings.

19.2.1 show dlr global

Display the global configuration of the DLR feature.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr global

19.2.2 show dlr ring config

Display the configuration of the DLR ring.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr ring config [<P-1>]

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.

19.2.3 show dlr ring status

Display the status of the DLR ring.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr ring status [<P-1>]

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.

19.2.4 show dlr ring participants

Display the participants list of the DLR ring.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr ring participants [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	1..65535	The DLR ring participant ID.

19.2.5 show dlr gateway config

Display the configuration of the DLR gateway.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr gateway config [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	1..255	The DLR gateway ID.

19.2.6 show dlr gateway status

Display the status of the DLR gateway.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dlr gateway status [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	1..255	The DLR ring ID.
P-2	1..255	The DLR gateway ID.

20 Domain Name System (DNS)

20.1 dns

Set DNS parameters.

20.1.1 dns cache adminstate

Enable or disable DNS cache.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns cache adminstate

■ no dns cache adminstate

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dns cache adminstate

20.1.2 dns cache flush

Flush the DNS cache.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns cache flush <P-1>

Parameter	Value	Meaning
P-1	action	Flush the DNS cache.

20.1.3 dns client adminstate

Enable or disable DNS Client.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client adminstate

■ no dns client adminstate

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dns client adminstate

20.1.4 dns client cache adminstate

Enable or disable DNS client cache.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client cache adminstate

■ no dns client cache adminstate

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dns client cache adminstate

20.1.5 dns client cache flush

Flush the DNS client cache.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client cache flush <P-1>

Parameter	Value	Meaning
P-1	action	Flush the DNS cache.

20.1.6 dns client domain-name

DNS Client default domain name.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client domain-name <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

20.1.7 dns client host add

Add a new DNS client host entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client host add <P-1> name <P-2> ip <P-3>

name: Enter the DNS host name.

ip: Enter the DNS host address.

Parameter	Value	Meaning
P-1	1..64	DNS Client hosts index.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

20.1.8 dns client host delete

Delete a DNS host entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client host delete <P-1>

Parameter	Value	Meaning
P-1	1..64	DNS Client hosts index.

20.1.9 dns client host modify

Modify a DNS client host entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client host modify <P-1> name <P-2> ip <P-3> status <P-4>

name: Enter the DNS host name.

ip: Enter the DNS host address.

status: Enter the status of the DNS host.

Parameter	Value	Meaning
P-1	1..64	DNS Client hosts index.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.
P-4	enable	Enable the option.
	disable	Disable the option.

20.1.10 dns client source

DNS Client configuration source.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client source <P-1>

Parameter	Value	Meaning
P-1	user	Use the DNS servers defined by the user.
	mgmt-dhcp	Use the DNS servers received by DHCP on the management interface.
	provider	

20.1.11 dns client servers add

Add a new DNS server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client servers add <P-1> ip <P-2>

ip: Enter the DNS server address.

Parameter	Value	Meaning
P-1	1..4	DNS Client servers index.
P-2	A.B.C.D	IP address.

20.1.12 dns client servers delete

Delete a DNS server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client servers delete <P-1>

Parameter	Value	Meaning
P-1	1..4	DNS Client servers index.

20.1.13 dns client servers modify

Modify a DNS server entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client servers modify <P-1> ip <P-2> status <P-3> operation <P-4>

ip: Change the DNS server address.

status: Change the status of this DNS server.

operation: Change the status of this DNS server.

Parameter	Value	Meaning
P-1	1..4	DNS Client servers index.
P-2	A.B.C.D	IP address.
P-3	enable	Enable the option.
	disable	Disable the option.
P-4	enable	Enable the option.
	disable	Disable the option.

20.1.14 dns client servers enable

Activate a DNS server entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client servers enable <P-1>

Parameter	Value	Meaning
P-1	1..4	DNS Client servers index.

20.1.15 dns client servers disable

Deactivate a DNS server entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client servers disable <P-1>

Parameter	Value	Meaning
P-1	1..4	DNS Client servers index.

20.1.16 dns client timeout

Set the timeout before retransmitting a request to the server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client timeout <P-1>

Parameter	Value	Meaning
P-1	0..3600	The timeout before retransmitting a request to the server (default: 3).

20.1.17 dns client retry

Set the number of times the request is retransmitted.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dns client retry <P-1>

Parameter	Value	Meaning
P-1	0..100	The number of times the request is retransmitted (default: 2).

20.2 show

Display device options and settings.

20.2.1 show dns client hosts

Display the DNS Client hosts table.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show dns client hosts

20.2.2 show dns client info

Display the DNS Client related information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show dns client info

20.2.3 show dns client servers

Display the DNS Client servers.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show dns client servers [<P-1>]

Parameter	Value	Meaning
P-1	extern	Display the DNS Client servers received from external sources.

21 DoS Mitigation

21.1 dos

Manage DoS Mitigation

21.1.1 dos tcp-null

Enables TCP Null scan protection - all TCP flags and TCP sequence number zero.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-null

■ no dos tcp-null

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos tcp-null

21.1.2 dos tcp-xmas

Enables TCP XMAS scan protection - TCP FIN, URG, PSH equal 1 and SEQ equals 0.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-xmas

■ no dos tcp-xmas

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos tcp-xmas

21.1.3 dos tcp-syn-fin

Enables TCP SYN/FIN scan protection - TCP with SYN and FIN flags set.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-syn-fin

■ no dos tcp-syn-fin

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos tcp-syn-fin

21.1.4 dos tcp-min-header

Enables TCP minimal header size check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-min-header

■ no dos tcp-min-header

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos tcp-min-header

21.1.5 dos icmp-fragmented

Enables fragmented ICMP protection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos icmp-fragmented

- no dos icmp-fragmented
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dos icmp-fragmented

21.1.6 dos icmp payload-check

Enables ICMP max payload size protection for IPv4 and IPv6.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos icmp payload-check

- no dos icmp payload-check
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dos icmp payload-check

21.1.7 dos icmp payload-size

Configures maximum ICMP payload size (default: 512).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos icmp payload-size <P-1>

Parameter	Value	Meaning
P-1	0..1472	Max. ICMP payload size (default: 512)

21.1.8 dos ip-land

Enables LAND attack protection - source IP equals destination IP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos ip-land <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

21.1.9 dos ip-src-route

Enables Drop IP source route - Discard packets with Strict/Loose Source Routing Option set.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos ip-src-route

- no dos ip-src-route
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dos ip-src-route

21.1.10 dos tcp-offset

Enables TCP offset check - ingress TCP packets with fragment offset 1 are dropped.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-offset

- no dos tcp-offset
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dos tcp-offset

21.1.11 dos tcp-syn

Enables TCP source port smaller than 1024 protection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos tcp-syn

■ no dos tcp-syn

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos tcp-syn

21.1.12 dos l4-port

Enables UDP or TCP source port equals destination port check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos l4-port

■ no dos l4-port

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos l4-port

21.1.13 dos icmp-smurf-attack

Enables ICMP smurf attack protection check.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dos icmp-smurf-attack

■ no dos icmp-smurf-attack

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dos icmp-smurf-attack

21.2 show

Display device options and settings.

21.2.1 show dos

Display the DoS Mitigation parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dos

22 IEEE 802.1as (Dot1as - Timing and Synchronization)

22.1 dot1as

Enable or disable the IEEE Std 802.1AS protocol.

22.1.1 dot1as operation

Enable or disable the IEEE Std 802.1AS protocol.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: dot1as operation
- no dot1as operation
- Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no dot1as operation

22.1.2 dot1as priority1

Configure the priority1 value (0..255) of the default data set.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as priority1 <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

22.1.3 dot1as priority2

Configure the priority2 value (0..255) of the default data set.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as priority2 <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

22.1.4 dot1as sync-lower-bound

Configure the lower bound for the PTP clock synchronization status in nanoseconds. If the absolute value of the offset to the master clock is smaller than the lower bound, clock's status is set to synchronized (true).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as sync-lower-bound <P-1>

Parameter	Value	Meaning
P-1	1..999999999	

22.1.5 dot1as sync-upper-bound

Configure the upper bound for the PTP clock synchronization status in nanoseconds. If the absolute value of the offset to the master clock is bigger than the upper bound, the clock's status is set to unsynchronized (false).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as sync-upper-bound <P-1>

Parameter	Value	Meaning
P-1	31..1000000000	

22.2 dot1as

Enable or disable 802.1as on a port.

22.2.1 dot1as operation

Enable or disable 802.1as on a port.

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as operation

■ no dot1as operation

Disable the option

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: no dot1as operation

22.2.2 dot1as pdelay-threshold

Set the pDelay threshold in nano seconds (0..1000000000).

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as pdelay-threshold <P-1>

Parameter	Value	Meaning
P-1	0..1000000000	The threshold for pdelay in [ns].

22.2.3 dot1as pdelay-interval

Configure the pDelay interval in seconds {1|2|4|8|disable}.

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as pdelay-interval <P-1>

Parameter	Value	Meaning
P-1	1	Set the pdelay message transmission interval to 1s.
	2	Set the pdelay message transmission interval to 2s.
	4	Set the pdelay message transmission interval to 4s.
	8	Set the pdelay message transmission interval to 8s.
	disable	Disable the transmission of pdelay messages.

22.2.4 dot1as announce-interval

Configure the announce interval in seconds {1|2|disable}.

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as announce-interval <P-1>

Parameter	Value	Meaning
P-1	1	Set the announce message transmission interval to 1s.
	2	Set the announce message transmission interval to 2s.
	disable	Disable the transmission of announce messages.

22.2.5 dot1as sync-interval

Configure the sync interval in seconds {0.25|0.5|1|disable}.

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as sync-interval <P-1>

Parameter	Value	Meaning
P-1	0.125	Set the sync message transmission interval to 125ms.
	0.25	Set the sync message transmission interval to 250ms.
	0.5	Set the sync message transmission interval to 500ms.
	1	Set the sync message transmission interval to 1s.
	disable	Disable the transmission of sync messages.

22.2.6 dot1as announce-timeout

Configure the announce receipt timeout (2..10).

- Mode: Interface Range Mode
- Privilege Level: Administrator
- Format: dot1as announce-timeout <P-1>

Parameter	Value	Meaning
P-1	2..10	Define the number of allowed lost announce messages.

22.2.7 dot1as sync-timeout

Configure the sync receipt timeout (2..10).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as sync-timeout <P-1>

Parameter	Value	Meaning
P-1	2..10	Define the number of allowed lost sync messages.

22.2.8 dot1as pdelay-timeout

Configure the pDelay receipt timeout (2..10).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: dot1as pdelay-timeout <P-1>

Parameter	Value	Meaning
P-1	2..10	Define number of allowed lost pdelay messages.

22.3 show

Display device options and settings.

22.3.1 show dot1as

Show 802.1AS global status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1as [global] [default] [current] [parent] [time-properties] [port] [stats]

[global]: Show 802.1AS global status

[default]: Show 802.1AS default data set.

[current]: Show 802.1AS current data set.

[parent]: Show 802.1AS parent data set.

[time-properties]: Show 802.1AS time properties data set.

[port]: Show 802.1AS port data set.

[stats]: Show 802.1AS port statistics data set.

23 IEEE 802.1x (Dot1x - Port Based Network Access Control)

23.1 dot1x

Configure 802.1X parameters.

23.1.1 dot1x dynamic-vlan

Creates VLANs dynamically when a RADIUS-assigned VLAN does not exist.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x dynamic-vlan

■ no dot1x dynamic-vlan

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x dynamic-vlan

23.1.2 dot1x radius_vlan_assignment

Command is deprecated. To enable or disable 802.1X RADIUS VLAN assignment use radius-vlan-assignment.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x radius_vlan_assignment

■ no dot1x radius_vlan_assignment

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x radius_vlan_assignment

23.1.3 dot1x radius-vlan-assignment

Enable or disable 802.1X RADIUS VLAN assignment support on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x radius-vlan-assignment

■ no dot1x radius-vlan-assignment

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x radius-vlan-assignment

23.1.4 dot1x system-auth-control

Enable or disable 802.1X authentication support on the switch.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x system-auth-control

■ no dot1x system-auth-control

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x system-auth-control

23.1.5 dot1x monitor

Enable or disable 802.1X monitor mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x monitor

- no dot1x monitor
- Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dot1x monitor

23.1.6 dot1x mac-authentication-bypass format group-size

Specify group-size for MAB.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x mac-authentication-bypass format group-size <P-1>

Parameter	Value	Meaning
P-1	1	
	2	
	4	
	12	

23.1.7 dot1x mac-authentication-bypass format group-separator

Specify group-separator for MAB.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x mac-authentication-bypass format group-separator <P-1>

Parameter	Value	Meaning
P-1	-	Use hyphen for MAB formatting.
	:	Use colon for MAB formatting.
	.	Use dot for MAB formatting.

23.1.8 dot1x mac-authentication-bypass format letter-case

Specify letter case for MAB.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x mac-authentication-bypass format letter-case <P-1>

Parameter	Value	Meaning
P-1	lower-case	Use lower-case for MAB formatting.
	upper-case	Use upper-case for MAB formatting.

23.1.9 dot1x mac-authentication-bypass password

Specify global password for MAB.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x mac-authentication-bypass password <P-1>

Parameter	Value	Meaning
P-1	string	<password> Enter a valid password for MAB.

23.2 dot1x

Configure 802.1X interface parameters.

23.2.1 dot1x guest-vlan

Configure a VLAN as 802.1X guest VLAN.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x guest-vlan <P-1>

Parameter	Value	Meaning
P-1	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.

23.2.2 dot1x max-req

Configure the maximum number of requests to be sent.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x max-req <P-1>

Parameter	Value	Meaning
P-1	1..10	Maximum number of requests (default: 2).

23.2.3 dot1x max-users

Configure the maximum number of supplicants on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x max-users <P-1>

Parameter	Value	Meaning
P-1	1..16	Maximum number of supplicants on a port (default: 16).

23.2.4 dot1x mac-auth-bypass

Configure MAC-Authentication bypass for the port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x mac-auth-bypass

■ no dot1x mac-auth-bypass

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x mac-auth-bypass

23.2.5 dot1x port-control

Set the authentication mode on the specified port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x port-control <P-1>

Parameter	Value	Meaning
P-1	auto	Port is actually controlled by protocol.
	force-authorized	Port is authorized unconditionally (default).
	force-unauthorized	Port is unauthorized unconditionally.
	multi-client	If more than one client is attached to the port, then each client needs to authenticate separately.

23.2.6 dot1x re-authentication

Enable or disable re-authentication for the given interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x re-authentication

■ no dot1x re-authentication

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x re-authentication

23.2.7 dot1x unauthenticated-vlan

Configure a VLAN as 802.1X unauthenticated VLAN.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x unauthenticated-vlan <P-1>

Parameter	Value	Meaning
P-1	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.

23.2.8 dot1x timeout guest-vlan-period

Command is deprecated. The guest-vlan-period is fixed to 3 times the tx-period.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout guest-vlan-period <P-1>

Parameter	Value	Meaning
P-1	1..300	Guest-vlan timeout in seconds (default: 90).

23.2.9 dot1x timeout reauth-period

Configure the re-authentication period.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout reauth-period <P-1>

Parameter	Value	Meaning
P-1	1..65535	Timeout in seconds.

23.2.10 dot1x timeout quiet-period

Configure the quiet period value.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout quiet-period <P-1>

Parameter	Value	Meaning
P-1	0..65535	Quiet period in seconds (default: 60).

23.2.11 dot1x timeout tx-period

Configure the transmit timeout period.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout tx-period <P-1>

Parameter	Value	Meaning
P-1	1..65535	Timeout in seconds.

23.2.12 dot1x timeout supp-timeout

Configure the supplicant timeout period.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout supp-timeout <P-1>

Parameter	Value	Meaning
P-1	1..65535	Timeout in seconds.

23.2.13 dot1x timeout server-timeout

Configure the server timeout period.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x timeout server-timeout <P-1>

Parameter	Value	Meaning
P-1	1..65535	Timeout in seconds.

23.2.14 dot1x initialize

Begins the initialization sequence on the specified port (port-control mode must be 'auto').

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x initialize

■ no dot1x initialize

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no dot1x initialize

23.2.15 dot1x re-authenticate

Begins the re-authentication sequence on the specified port (port-control mode must be 'auto').

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: dot1x re-authenticate

- no dot1x re-authenticate
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no dot1x re-authenticate

23.3 show

Display device options and settings.

23.3.1 show dot1x global

Display the global 802.1X configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x global

23.3.2 show dot1x auth-history

Display the 802.1X authentication events and information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x auth-history [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..4294967294	802.1X history log entry index. This can be specified only if interface is provided. Parameter Usage: [<slot/port> [index]]

23.3.3 show dot1x detail

Display the detailed 802.1X configuration for the specified port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x detail <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

23.3.4 show dot1x summary

Display the summary information about the 802.1X configuration for a specified port or all ports.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x summary [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

23.3.5 show dot1x clients

Display the 802.1X client information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x clients [<P-1>]

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.

23.3.6 show dot1x statistics

Display the 802.1X statistics for the specified port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show dot1x statistics <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

23.4 clear

Clear several items.

23.4.1 clear dot1x statistics port

Resets the 802.1X statistics for specified port.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear dot1x statistics port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

23.4.2 clear dot1x statistics all

Resets the 802.1X statistics for all ports.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear dot1x statistics all

23.4.3 clear dot1x auth-history port

Clears the 802.1X authentication history for specified port.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear dot1x auth-history port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

23.4.4 clear dot1x auth-history all

Clears the 802.1X authentication history for all ports.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear dot1x auth-history all

24 IEEE 802.3ad (Dot3ad - Link Aggregation)

24.1 link-aggregation

Configure 802.3ad link aggregation parameters to increase bandwidth and provide redundancy by combining connections.

24.1.1 link-aggregation add

Create a new Link Aggregation Group to increase bandwidth and provide link redundancy. If desired, enter a name up to 15 alphanumeric characters in length.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: link-aggregation add <P-1>

Parameter	Value	Meaning
P-1	lag/<lagport>	lag/<lagport> Enter a lag interface in lag/lagport format.

24.1.2 link-aggregation modify

Modify the parameters for the specified Link Aggregation Group.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: link-aggregation modify <P-1> name <P-2> addport <P-3> deleteport <P-4> adminmode linktrap static hashmode <P-5> min-links <P-6>

name: Modify the name of the specified Link Aggregation Group.

addport: Add the specified port to the Link Aggregation Group.

deleteport: Delete the specified port from the Link Aggregation Group.

adminmode: Modify the administration mode of the specified Link Aggregation Group. To activate the group, enable the administration mode.

linktrap: Enable/Disable link trap notifications for the specified Link Aggregation Group

static: Enable or disable static capability for the specified Link Aggregation Group on a device. When enabled, LACP automatically helps prevent loops and allows non-link aggregation partners to support LACP.

hashmode: Set the hash mode to be used by the load balancing algorithm for specified Link Aggregation Group.

min-links: Set the minimum links for the specified Link Aggregation Group.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	string	Enter a user-defined text, max. 15 characters.
P-3	slot no./port no.	
P-4	slot no./port no.	
P-5	src-mac	Source MAC, VLAN, EtherType, and incoming port associated with the packet.
	dst-mac	Destination MAC, VLAN, EtherType, and incoming port associated with the packet.
	src-dst-mac	Source/Destination MAC, VLAN, EtherType, and incoming port associated with the packet.
	src-ip	Source IP and Source TCP/UDP fields of the packet.
	dst-ip	Destination IP and Destination TCP/UDP Port fields of the packet.
	src-dst-ip	Source/Destination IP and source/destination TCP/UDP Port fields of the packet.
P-6	slot no./port no.	

■ no link-aggregation modify

Disable the option

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: no link-aggregation modify <P-1> name addport deleteport adminmode linktrap static hashmode min-links

24.1.3 link-aggregation delete

Delete the Link Aggregation Group to divide the group into individual connections.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: link-aggregation delete <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

24.1.4 link-aggregation hashmode

Set the hash mode to be used by the load balancing algorithm for all Link Aggregation Groups.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: link-aggregation hashmode <P-1>

Parameter	Value	Meaning
P-1	src-mac	Source MAC, VLAN, EtherType, and incoming port associated with the packet.
	dst-mac	Destination MAC, VLAN, EtherType, and incoming port associated with the packet.
	src-dst-mac	Source/Destination MAC, VLAN, EtherType, and incoming port associated with the packet.
	src-ip	Source IP and Source TCP/UDP fields of the packet.
	dst-ip	Destination IP and Destination TCP/UDP Port fields of the packet.
	src-dst-ip	Source/Destination IP and source/destination TCP/UDP Port fields of the packet.

24.2 lacp

Configure lacp parameters.

24.2.1 lacp admin-key

Configure the administrative value of the key on this LAG.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp admin-key <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.2 lacp collector-max-delay

Configure the collector max delay on this LAG (default is 0).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp collector-max-delay <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.3 lacp lacpmode

Activate/deactivate LACP on an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp lacpmode

■ no lacp lacpmode

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lacp lacpmode

24.2.4 lacp actor admin key

Configure the value of the LACP actor admin key on this port (default 0).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp actor admin key <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.5 lacp actor admin state lacp-activity

Enable/disable the LACP activity on the actor admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp actor admin state lacp-activity

- no lacp actor admin state lacp-activity
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp actor admin state lacp-activity

24.2.6 lacp actor admin state lacp-timeout

Enable/disable the LACP timeout on the actor admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp actor admin state lacp-timeout

- no lacp actor admin state lacp-timeout
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp actor admin state lacp-timeout

24.2.7 lacp actor admin state aggregation

Enable/disable the aggregation on the actor admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp actor admin state aggregation

- no lacp actor admin state aggregation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp actor admin state aggregation

24.2.8 lacp actor admin port priority

Set LACP actor port priority value (default 128).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp actor admin port priority <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.9 lacp partner admin key

Configure the administrative value of the LACP key for the protocol partner on this LAG (default 0).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin key <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.10 lacp partner admin state lacp-activity

Enable/disable the LACP activity on the partner admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin state lacp-activity

- no lacp partner admin state lacp-activity
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp partner admin state lacp-activity

24.2.11 lacp partner admin state lacp-timeout

Enable/disable the LACP timeout on the partner admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin state lacp-timeout

- no lacp partner admin state lacp-timeout
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp partner admin state lacp-timeout

24.2.12 lacp partner admin state aggregation

Enable/disable the state aggregation on the partner admin state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin state aggregation

- no lacp partner admin state aggregation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lacp partner admin state aggregation

24.2.13 lacp partner admin port priority

Set LACP partner port priority value (default 128).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin port priority <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.14 lacp partner admin port id

Set LACP partner port value (default 0).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin port id <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.15 lacp partner admin system-priority

Configure the partner system priority.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin system-priority <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

24.2.16 lacp partner admin system-id

Configure the MAC address representing the administrative value of the LAG ports protocol partner system ID default (00:00:00:00:00:00).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lacp partner admin system-id <P-1>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.

24.3 show

Display device options and settings.

24.3.1 show link-aggregation global

Display the Common and Internal Link-Aggregation information and settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show link-aggregation global

24.3.2 show link-aggregation port

Display the LAG configuration of a single port.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show link-aggregation port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.3 show link-aggregation statistics

Display the ports LAG statistics.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show link-aggregation statistics [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.4 show link-aggregation members

Display the member ports for the specified LAG.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show link-aggregation members <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.5 show lacp interface

Display the LAG interfaces attributes.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lacp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.6 show lacp mode

Display the LACP mode.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lacp mode [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.7 show lacp actor

Display the Link Aggregation control protocol actor attributes.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lacp actor [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.8 show lacp partner operational

Display the Link Aggregation control protocol operational partner attributes.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lacp partner operational [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

24.3.9 show lacp partner admin

Display the Link Aggregation control protocol administrative partner attributes.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lacp partner admin [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

25 Distance Vector Multicast Routing Protocol (DVMRP)

25.1 ip

Set IP parameters.

25.1.1 ip dvmrp operation

Configure DVMRP admin mode.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip dvmrp operation
-
- no ip dvmrp operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dvmrp operation

25.1.2 ip dvmrp trapflag

Enable or disable the DVMRP trap mode.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip dvmrp trapflag
-
- no ip dvmrp trapflag
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dvmrp trapflag

25.1.3 ip dvmrp route-expire

Configure DVMRP route expire time in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dvmrp route-expire <P-1>

Parameter	Value	Meaning
P-1	0..200	Enter a number in the given range.

25.2 ip

IP interface commands.

25.2.1 ip dvmrp operation

Configure DVMRP admin mode.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip dvmrp operation
-
- no ip dvmrp operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip dvmrp operation

25.2.2 ip dvmrp metric

Set DVMRP metric.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip dvmrp metric <P-1>

Parameter	Value	Meaning
P-1	1..31	Enter a number in the given range.

25.3 show

Display device options and settings.

25.3.1 show ip dvmrp global

Display the DVMRP global related parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp global

25.3.2 show ip dvmrp interface

Display the DVMRP interface related parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

25.3.3 show ip dvmrp neighbor

Display the DVMRP neighbor information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp neighbor [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	A.B.C.D	IP address.

25.3.4 show ip dvmrp route

Display the multicast routing information for DVMRP.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp route [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

25.3.5 show ip dvmrp nexthop

Display the next hop information on outgoing interfaces for DVMRP routing multicast datagrams.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp nexthop

25.3.6 show ip dvmrp prune

Display the upstream router prune information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip dvmrp prune

26 Ethernet IP

26.1 ethernet-ip

Enable or disable the EtherNet/IP operation on this device. If disabled, the EtherNet/IP protocol is deactivated, but the EtherNet/IP MIBs can be accessed.

26.1.1 ethernet-ip operation

Enable or disable the EtherNet/IP operation on this device. If disabled, the EtherNet/IP protocol is deactivated, but the EtherNet/IP MIBs can be accessed.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ethernet-ip operation

■ no ethernet-ip operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ethernet-ip operation

26.1.2 ethernet-ip vlan-id

Set the EtherNet/IP VLAN on this device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ethernet-ip vlan-id <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the EtherNet/IP VLAN ID.
	mgmt	Management VLAN

26.1.3 ethernet-ip write-access

Enable or disable the write-access of the EtherNet/IP protocol (possible security risk, as EtherNet/IP communication is not authenticated).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ethernet-ip write-access

■ no ethernet-ip write-access

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ethernet-ip write-access

26.1.4 ethernet-ip interface

Configure the interface in slot/port or vlan/vlan-id or mgmt format.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ethernet-ip interface <P-1>

Parameter	Value	Meaning
P-1	mgmt	Management interface
	slot no./port no.	Physical routing interface
	vlan/vlan no.	VLAN routing interface

26.2 show

Display device options and settings.

26.2.1 show ethernet-ip

Display the EtherNet/IP settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ethernet-ip

26.3 copy

Copy different kinds of items.

26.3.1 copy eds-ethernet-ip system remote

Copy the EDS file from the device to a file server

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy eds-ethernet-ip system remote <P-1> [source-interface <P-2>]
[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

26.3.2 copy eds-ethernet-ip system envm

Copy the EDS file from the device to external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy eds-ethernet-ip system envm

27 Filtering Database (FDB)

27.1 mac-filter

27.1.1 mac-filter

Static MAC filter configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac-filter <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	1..4042	Enter the VLAN ID.

- no mac-filter
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mac-filter <P-1> <P-2>

27.2 bridge

Bridge configuration.

27.2.1 bridge aging-time

Aging time configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: bridge aging-time <P-1>

Parameter	Value	Meaning
P-1	10..500000	Enter a number in the given range.

27.3 show

Display device options and settings.

27.3.1 show mac-filter-table static

Display the MAC address filter table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac-filter-table static

27.4 show

Display device options and settings.

27.4.1 show bridge aging-time

Address aging time.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show bridge aging-time

27.5 show

Display device options and settings.

27.5.1 show mac-addr-table

Display the MAC address table.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show mac-addr-table [<P-1>]

Parameter	Value	Meaning
P-1	a:b:c:d:e:f	Enter a MAC address.
	1..4042	Enter a VLAN ID.

27.6 clear

Clear several items.

27.6.1 clear mac-addr-table

Clears the MAC address table.

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** clear mac-addr-table

28 GARP VLAN and Multicast Registration Protocol (GVRP and GMRP)

28.1 garp

Configure GARP protocols, GVRP for dynamic VLAN registration and GMRP for dynamic MAC registration.

28.1.1 garp gvrp operation

Enable or disable GVRP globally. When enabled, the device distributes VLAN membership information on GVRP enable active ports. GVRP-aware devices use the information to dynamically create VLAN members and update the local VLAN member database.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `garp gvrp operation`

■ no garp gvrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `no garp gvrp operation`

28.1.2 garp gmrp operation

Enable or disable GMRP globally. Devices use GMRP information for dynamic registration of group membership and individual MAC addresses with end devices and switches that support extended filtering services, within the connected LAN.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `garp gmrp operation`

■ no garp gmrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `no garp gmrp operation`

28.1.3 garp gmrp forward-unknown

Configure if unknown multicast packets are forwarded. The setting can be discard or flood.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `garp gmrp forward-unknown <P-1>`

Parameter	Value	Meaning
P-1	flood	Unknown multicast frames will be flooded.
	discard	Unknown multicast frames will be discarded.

28.2 garp

Configure GARP parameters and protocols, GVRP for dynamic VLAN registration and GMRP for dynamic MAC registration on a port.

28.2.1 garp interface join-time

Set the GARP join time-interval. The join timer controls the interval between join message transmissions sent to applicant state machines. An instance of this timer is required on a per-Port, per-GARP participant basis.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: `garp interface join-time <P-1>`

Parameter	Value	Meaning
P-1	10..100	Join time-interval in centiseconds.

28.2.2 garp interface leave-time

Set the GARP leave time-interval. The leave timer controls the period of time that the registrar state machine waits in the leave state before transiting to the empty state. An instance of the timer is required for each state machine in the leave state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: garp interface leave-time <P-1>

Parameter	Value	Meaning
P-1	20..600	Leave time-interval in centiseconds.

28.2.3 garp interface leave-all-time

Set the GARP leave-all time-interval. The leave all timer controls the frequency with which the leaveall state machine generates leaveall PDUs. The timer is required on a per-Port, per-GARP Participant basis.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: garp interface leave-all-time <P-1>

Parameter	Value	Meaning
P-1	200..6000	Leave-All time-interval in centiseconds.

28.2.4 garp gvrp operation

Enable or disable GVRP on the port. When enabled, globally and on this port, the device distributes VLAN membership information to GVRP aware devices connected to this port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: garp gvrp operation

- no garp gvrp operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no garp gvrp operation

28.2.5 garp gmrp operation

Enable or disable GMRP on the interface, with GMRP enabled globally and on this interface, the device sends and receives GMRP messages on this port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: garp gmrp operation

- no garp gmrp operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no garp gmrp operation

28.2.6 garp gmrp forward-all-groups

Configure forward-all behavior for GMRP on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: garp gmrp forward-all-groups

- no garp gmrp forward-all-groups
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no garp gmrp forward-all-groups

28.3 show

Display device options and settings.

28.3.1 show garp interface

Display the global configuration of GARP per interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

28.3.2 show garp gvrp global

Display the GVRP global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gvrp global

28.3.3 show garp gvrp interface

Display the GVRP interface configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gvrp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

28.3.4 show garp gvrp statistics interface

Display the GVRP interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gvrp statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

28.3.5 show garp gmrp global

Display the GMRP global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gmrp global

28.3.6 show garp gmrp interface

Display the GMRP interface configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gmrp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

28.3.7 show garp gmrp statistics interface

Display the GMRP interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show garp gmrp statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

28.4 show

Display device options and settings.

28.4.1 show mac-filter-table gmrp

Display the GMRP entries in the MFDB table.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show mac-filter-table gmrp

29 HiDiscovery

29.1 network

Configure the inband and outband connectivity.

29.1.1 network hidiscovery operation

Enable/disable the HiDiscovery protocol on this device.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network hidiscovery operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the HiDiscovery protocol.
	disable	Disable the HiDiscovery protocol.

■ no network hidiscovery operation

Disable the option

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: no network hidiscovery operation <P-1>

29.1.2 network hidiscovery mode

Set the access level for HiDiscovery.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network hidiscovery mode <P-1>

Parameter	Value	Meaning
P-1	read-write	Allow detection and configuration.
	read-only	Allow only detection, no configuration.

29.1.3 network hidiscovery blinking

Enable/disable the HiDiscovery blinking sequence on this device. This preference is not saved in configuration

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network hidiscovery blinking

■ no network hidiscovery blinking

Disable the option

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: no network hidiscovery blinking

29.1.4 network hidiscovery relay

Enable/disable the HiDiscovery relay status.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network hidiscovery relay

■ no network hidiscovery relay

Disable the option

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: no network hidiscovery relay

29.1.5 network hidiscovery operation

Enable/disable the HiDiscovery protocol on this device.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network hidiscovery operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the HiDiscovery protocol.
	disable	Disable the HiDiscovery protocol.

- no network hidiscovery operation
 - Disable the option
 - Mode: Privileged Exec Mode
 - Privilege Level: Operator
 - Format: no network hidiscovery operation <P-1>

29.1.6 network hidiscovery mode

Set the access level for HiDiscovery.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: network hidiscovery mode <P-1>

Parameter	Value	Meaning
P-1	read-write	Allow detection and configuration.
	read-only	Allow only detection, no configuration.

29.1.7 network hidiscovery blinking

Enable/disable the HiDiscovery blinking sequence on this device. This preference is not saved in configuration

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: network hidiscovery blinking

- no network hidiscovery blinking
 - Disable the option
 - Mode: Privileged Exec Mode
 - Privilege Level: Operator
 - Format: no network hidiscovery blinking

29.1.8 network hidiscovery relay

Enable/disable the HiDiscovery relay status.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: network hidiscovery relay

- no network hidiscovery relay
 - Disable the option
 - Mode: Privileged Exec Mode
 - Privilege Level: Operator
 - Format: no network hidiscovery relay

29.2 show

Display device options and settings.

29.2.1 show network hidiscovery

Display the HiDiscovery settings.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show network hidiscovery

30 HIPER-Ring

30.1 hiper-ring

Configure the HIPER Ring settings.

30.1.1 hiper-ring operation

Enable or disable the HIPER Ring operation.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hiper-ring operation

- no hiper-ring operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no hiper-ring operation

30.1.2 hiper-ring mode

Configure the HIPER Ring mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hiper-ring mode <P-1>

Parameter	Value	Meaning
P-1	client	The device will be in the role of a ring client (ring-switch).

30.1.3 hiper-ring primary-port

Configure the primary ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hiper-ring primary-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

30.1.4 hiper-ring secondary-port

Configure the secondary ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hiper-ring secondary-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

30.2 show

Display device options and settings.

30.2.1 show hiper-ring global

Display the HIPER Ring global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hiper-ring global

31 High-availability Seamless Redundancy (HSR)

31.1 hsr

Configure High-availability Seamless Redundancy protocol (HSR) parameters.

31.1.1 hsr operation

Enable or disable the High-availability Seamless Redundancy protocol (HSR).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hsr operation

■ no hsr operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no hsr operation

31.1.2 hsr instance

Configure HSR instances

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: hsr instance <P-1> operation port-a port-b supervision evaluate send redbox-exclusively mode <P-2> switching-node-type <P-3> redbox-id <P-4> speed <P-5>

operation: Enable or disable the HSR instance.

port-a: Enable or disable the first port of HSR line.

port-b: Enable or disable the second port of the HSR line.

supervision: Configure the HSR supervision tx and rx packet handling.

evaluate: Enable or disable evaluation of received supervision packets.

send: Enable or disable sending of supervision packets.

redbox-exclusively: Enable sending of supervision packets for this RedBox exclusively. Use the no form of the command to send supervision packets for each connected VDAN and this RedBox (if send is enabled).

mode: Modify HSR operating mode.

switching-node-type: Modify HSR switching end node type.

redbox-id: Modify RedBox identity.

speed: Configure the speed of LRE interfaces.

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).
P-2	modeh	HSR mode h - bridging of HSR traffic (default HSR mode).
	modeu	HSR mode u - like mode h, but unicast messages are not removed.
P-3	hsrredboxsan	An HSR RedBox with regular Ethernet traffic on its interlink.
	hsrredboxprpa	An HSR RedBox with PRP traffic for LAN A on its interlink.
	hsrredboxprpb	An HSR RedBox with PRP traffic for LAN B on its interlink.
P-4	id1a	Redbox pair 1 to LAN A.
	id1b	Redbox pair 1 to LAN B.
	id2a	Redbox pair 2 to LAN A.
	id2b	Redbox pair 2 to LAN B.
	id3a	Redbox pair 3 to LAN A.
	id3b	Redbox pair 3 to LAN B.
	id4a	Redbox pair 4 to LAN A.
	id4b	Redbox pair 4 to LAN B.
	id5a	Redbox pair 5 to LAN A.
	id5b	Redbox pair 5 to LAN B.
	id6a	Redbox pair 6 to LAN A.
	id6b	Redbox pair 6 to LAN B.
	id7a	Redbox pair 7 to LAN A.
	id7b	Redbox pair 7 to LAN B.
P-5	100	100 MBit/s
	1000	1000 MBit/s

- no hsr instance
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no hsr instance <P-1> operation port-a port-b supervision evaluate send redbox-exclusively mode switching-node-type redbox-id speed

31.2 clear

Clear several items.

31.2.1 clear hsr proxy-node-table

Clear proxy-node-table.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear hsr proxy-node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.2.2 clear hsr node-table

Clear node-table (received supervision packets).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear hsr node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.2.3 clear hsr counters

Clear HSR counters.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear hsr counters [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.3 show

Display device options and settings.

31.3.1 show hsr global

Display the global preferences.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hsr global

31.3.2 show hsr instance

Display the HSR instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hsr instance [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.3.3 show hsr node-table

Display the node table (received supervision packets).

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hsr node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.3.4 show hsr proxy-node-table

Display the proxy node table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hsr proxy-node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

31.3.5 show hsr counters

Display the HSR counters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show hsr counters [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter HSR instance number (only 1 supported).

32 Hypertext Transfer Protocol (HTTP)

32.1 http

Set HTTP parameters.

32.1.1 http port

Set the HTTP port number.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: http port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of the HTTP server (default: 80).

32.1.2 http server

Enable or disable the HTTP server.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: http server
-
- no http server
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no http server

32.2 show

Display device options and settings.

32.2.1 show http

Display the HTTP server information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show http

33 HTTP Secure (HTTPS)

33.1 https

Set HTTPS parameters.

33.1.1 https server

Enable or disable the HTTPS server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: https server
- no https server
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no https server

33.1.2 https port

Set the HTTPS port number.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: https port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of the web server (default: 443).

33.1.3 https fingerprint-type

Configure fingerprint type.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: https fingerprint-type <P-1>

Parameter	Value	Meaning
P-1	sha1	Configure sha1 fingerprint
	sha256	Configure sha256 fingerprint

33.1.4 https certificate

Generate/Delete HTTPS X509/PEM certificate.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: https certificate <P-1>

Parameter	Value	Meaning
P-1	generate	Generates the item
	delete	Deletes the item

33.2 copy

Copy different kinds of items.

33.2.1 copy httpscert remote

Copy X509/PEM certificate from a server to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy httpscert remote <P-1> nvm [source-interface <P-2>]

nvm: Copy HTTPS certificate (PEM) from a server to the device.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

Parameter	Value	Meaning
P-2	slot no./port no.	

33.2.2 copy https-cert envm

Copy X509/PEM certificate from external non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy https-cert envm <P-1> nvm

nvm: Copy X509/PEM certificate from external non-volatile memory to the device.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

33.3 show

Display device options and settings.

33.3.1 show https

Display the HTTPS server information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show https

34 Integrated Authentication Server (IAS)

34.1 ias-users

Manage IAS Users and User Accounts.

34.1.1 ias-users add

Add a new IAS user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ias-users add <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

34.1.2 ias-users delete

Delete an existing IAS user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ias-users delete <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

34.1.3 ias-users enable

Enable IAS user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ias-users enable <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

34.1.4 ias-users disable

Disable IAS user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ias-users disable <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

34.1.5 ias-users password

Change IAS user password.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ias-users password <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	string	Enter a user-defined text, max. 64 characters.

34.2 show

Display device options and settings.

34.2.1 show ias-users

Display the IAS users and user accounts information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show ias-users

35 IEC 61850 MMS Server

35.1 iec61850-mms

Configure the IEC61850 MMS Server settings.

35.1.1 iec61850-mms operation

Enable or disable the IEC61850 MMS Server. The MMS server facilitates real-time distribution of data and supervisory control functions for substations.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: iec61850-mms operation
- no iec61850-mms operation
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no iec61850-mms operation

35.1.2 iec61850-mms write-access

Enable or disable the Write-Access on IEC61850 bridge objects via MMS. Write services allow the MMS client to access application content. - Possible security risk, as MMS communication is not authenticated -

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: iec61850-mms write-access
- no iec61850-mms write-access
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no iec61850-mms write-access

35.1.3 iec61850-mms port

Defines the port number of the IEC61850 MMS server (default: 102).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: iec61850-mms port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of the IEC61850 MMS server (default: 102).

35.1.4 iec61850-mms max-sessions

Defines the maximum number of concurrent IEC61850 MMS sessions (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: iec61850-mms max-sessions <P-1>

Parameter	Value	Meaning
P-1	1..15	Maximum number of concurrent IEC61850 MMS sessions (default: 5).

35.1.5 iec61850-mms technical-key

Defines the IEC61850 MMS Technical Key (default: KEY).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: iec61850-mms technical-key <P-1>

Parameter	Value	Meaning
P-1	string	Enter a IEC61850-7-2 Ed. VisibleString, max. 32 characters. The following characters are allowed: VisibleString (FROM ('A' 'a' 'B' 'b' 'C' 'c' 'D' 'd' 'E' 'e' 'F' 'f' 'G' 'g' 'H' 'h' 'I' 'i' 'J' 'j' 'K' 'k' 'L' 'l' 'M' 'm' 'N' 'n' 'O' 'o' 'P' 'p' 'Q' 'q' 'R' 'r' 'S' 's' 'T' 't' 'U' 'u' 'V' 'v' 'W' 'w' 'X' 'x' 'Y' 'y' 'Z' 'z' '_' '0' '1' '2' '3' '4' '5' '6' '7' '8' '9'))

35.2 show

Display device options and settings.

35.2.1 show iec61850-mms

Display the IEC61850 MMS server settings.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** `show iec61850-mms`

36 Internet Group Management Protocol (IGMP)

36.1 ip

Set IP parameters.

36.1.1 ip igmp operation

Enable or disable IGMP globally on the device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp operation

■ no ip igmp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip igmp operation

36.2 ip

IP interface commands.

36.2.1 ip igmp operation

Enables or disables IGMP on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp operation

■ no ip igmp operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip igmp operation

36.2.2 ip igmp version

Configure IGMP version.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp version <P-1>

Parameter	Value	Meaning
P-1	1..3	Enter igmp version (default: 3).

36.2.3 ip igmp robustness

Configure IGMP router robustness.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp robustness <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter igmp query robustness (default: 2).

36.2.4 ip igmp querier query-interval

Configure IGMP query interval in seconds.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp querier query-interval <P-1>

Parameter	Value	Meaning
P-1	1..3600	Enter igmp query interval (default: 125).

36.2.5 ip igmp querier last-member-interval

Configure last member query interval in tenths of seconds.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp querier last-member-interval <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter igmp last member query interval (default: 10).

36.2.6 ip igmp querier max-response-time

Configure maximum response time in tenths of seconds.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp querier max-response-time <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter igmp query maximum response time (default: 100).

36.3 show

Display device options and settings.

36.3.1 show ip igmp global

Display the IGMP global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Operator
- ▶ Format: show ip igmp global

36.3.2 show ip igmp interface

Display the IGMP interface information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Operator
- ▶ Format: show ip igmp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

36.3.3 show ip igmp membership

Display the interfaces subscribed to the multicast group.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Operator
- ▶ Format: show ip igmp membership

36.3.4 show ip igmp groups

Display the subscribed multicast groups.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Operator
- ▶ Format: show ip igmp groups

36.3.5 show ip igmp statistics

Display the IGMP statistical information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Operator
- ▶ Format: show ip igmp statistics [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

37 IGMP Proxy

37.1 ip

Set IP parameters.

37.1.1 ip igmp-proxy interface

This command enables/disables IGMP Proxy on the router and configures the host interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp-proxy interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

- no ip igmp-proxy interface
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip igmp-proxy interface <P-1>

37.1.2 ip igmp-proxy report-interval

Sets the unsolicited report interval in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip igmp-proxy report-interval <P-1>

Parameter	Value	Meaning
P-1	1..260	Enter a number in the given range.

37.2 show

Display device options and settings.

37.2.1 show ip igmp-proxy global

Display a summary of the host interface status parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip igmp-proxy global

37.2.2 show ip igmp-proxy groups

Display the information about the subscribed multicast groups that IGMP Proxy reported.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip igmp-proxy groups

37.2.3 show ip igmp-proxy source-list

Display the source-list of each subscribed multicast group that IGMP Proxy reported.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip igmp-proxy source-list

38 IGMP Snooping

38.1 igmp-snooping

Configure IGMP snooping.

38.1.1 igmp-snooping mode

Enable or disable IGMP snooping.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping mode

■ no igmp-snooping mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no igmp-snooping mode

38.1.2 igmp-snooping querier mode

Enable or disable IGMP snooping querier on the system.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping querier mode

■ no igmp-snooping querier mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no igmp-snooping querier mode

38.1.3 igmp-snooping querier query-interval

Sets the IGMP querier query interval time (1-1800) in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping querier query-interval <P-1>

Parameter	Value	Meaning
P-1	1..1800	Enter a number in the given range.

38.1.4 igmp-snooping querier timer-expiry

Sets the IGMP querier timer expiration period (60-300) in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping querier timer-expiry <P-1>

Parameter	Value	Meaning
P-1	60..300	Enter a number in the given range.

38.1.5 igmp-snooping querier version

Sets the IGMP version (1-3) of the query.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping querier version <P-1>

Parameter	Value	Meaning
P-1	1..3	IGMP snooping querier's protocol version(1 to 3,default: 2).

38.1.6 igmp-snooping forward-unknown

Configure if and how unknown multicasts are forwarded. The setting can be discard, flood or query-ports. The default is flood.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping forward-unknown <P-1>

Parameter	Value	Meaning
P-1	discard	Unknown multicast frames will be discarded.
	flood	Unknown multicast frames will be flooded.
	query-ports	Unknown multicast frames will be forwarded only to query ports.

38.2 igmp-snooping

Configure IGMP snooping.

38.2.1 igmp-snooping vlan-id

Configure the VLAN parameters.

- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: igmp-snooping vlan-id <P-1> mode fast-leave groupmembership-interval <P-2> maxresponse <P-3> mcrtrexpiretime <P-4> querier mode address <P-5> forward-known <P-6> forward-all <P-7> static-query-port <P-8> automatic-mode <P-9>

mode: Enable or disable IGMP snooping per VLAN.

fast-leave: Enable or disable IGMP snooping fast-leave per VLAN.

groupmembership-interval: Set IGMP group membership interval time (2-3600) in seconds per VLAN.

maxresponse: Set the igmp maximum response time (1-25) in seconds per VLAN.

mcrtrexpiretime: Sets the multicast router present expiration time (0-3600) in seconds per VLAN.

querier: Set IGMP snooping querier on the system.

mode: Enable or disable IGMP snooping querier per VLAN.

address: Set IGMP snooping querier address on the system using a VLAN.

forward-known: Sets the mode how known multicast packets will be treated. The default value is registered-ports-only(2).

forward-all: Enable or disable IGMP snooping forward-all.

static-query-port: Enable or disable IGMP snooping static-query-port.

automatic-mode: Enable or disable IGMP snooping automatic-mode.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	2..3600	Enter a number in the given range.
P-3	1..25	Enter a number in the given range.
P-4	0..3600	Enter a number in the given range.
P-5	A.B.C.D	IP address.
P-6	query-and-registered-ports	Addition of query ports to multicast filter portmasks.
	registered-ports-only	No addition of query ports to multicast filter portmasks.
P-7	slot no./port no.	
P-8	slot no./port no.	
P-9	slot no./port no.	

■ no igmp-snooping vlan-id

Disable the option

- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: no igmp-snooping vlan-id <P-1> mode fast-leave groupmembership-interval maxresponse mcrtrexpiretime querier mode address forward-known forward-all <P-7> static-query-port <P-8> automatic-mode <P-9>

38.3 igmp-snooping

Configure IGMP snooping.

38.3.1 igmp-snooping mode

Enable or disable IGMP snooping per interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: igmp-snooping mode

- no igmp-snooping mode
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no igmp-snooping mode

38.3.2 igmp-snooping fast-leave

Enable or disable IGMP snooping fast-leave per interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping fast-leave

- no igmp-snooping fast-leave
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no igmp-snooping fast-leave

38.3.3 igmp-snooping groupmembership-interval

Set IGMP group membership interval time (2-3600) in seconds per interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping groupmembership-interval <P-1>

Parameter	Value	Meaning
P-1	2..3600	Enter a number in the given range.

38.3.4 igmp-snooping maxresponse

Set the igmp maximum response time (1-25) in seconds per interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping maxresponse <P-1>

Parameter	Value	Meaning
P-1	1..25	Enter a number in the given range.

38.3.5 igmp-snooping mcartreptime

Sets the multicast router present expiration time (0-3600) in seconds per interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping mcartreptime <P-1>

Parameter	Value	Meaning
P-1	0..3600	Enter a number in the given range.

38.3.6 igmp-snooping static-query-port

Configures the interface as a static query interface in all VLANs.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: igmp-snooping static-query-port

- no igmp-snooping static-query-port
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no igmp-snooping static-query-port

38.4 show

Display device options and settings.

38.4.1 show igmp-snooping global

Display the IGMP snooping global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping global

38.4.2 show igmp-snooping interface

Display the IGMP snooping interface information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

38.4.3 show igmp-snooping vlan

Display the IGMP snooping VLAN information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

38.4.4 show igmp-snooping querier global

Display the IGMP snooping querier information per VLAN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping querier global

38.4.5 show igmp-snooping querier vlan

Display the IGMP snooping querier VLAN information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping querier vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

38.4.6 show igmp-snooping enhancements vlan

Display the IGMP snooping VLAN information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping enhancements vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

38.4.7 show igmp-snooping enhancements unknown-filtering

Display the unknown multicast filtering information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping enhancements unknown-filtering

38.4.8 show igmp-snooping statistics global

Display the number of control packets processed by CPU.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping statistics global

38.4.9 show igmp-snooping statistics interface

Display the number of control packets processed by CPU per interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show igmp-snooping statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

38.5 show

Display device options and settings.

38.5.1 show mac-filter-table igmp-snooping

Display the IGMP snooping entries in the MFDB table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac-filter-table igmp-snooping

38.6 clear

Clear several items.

38.6.1 clear igmp-snooping

Clear all IGMP snooping entries.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear igmp-snooping

39 Interface

39.1 shutdown

39.1.1 shutdown

Enable or disable the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: shutdown

■ no shutdown

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no shutdown

39.2 auto-negotiate

Enable or disable automatic negotiation on the interface. The cable crossing settings have no effect if auto-negotiation is enabled. In this case cable crossing is always set to auto. Cable crossing is set to the value chosen by the user if auto-negotiation is disabled.

39.2.1 auto-negotiate speed

Additionally, enter the speed to be used for advertise capabilities.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-negotiate <P-1> speed <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	10	10 MBit/s.
	100	100 MBit/s.
	1000	1 GBit/s.
P-2	full	Full-Duplex.
	half	Half-Duplex.

■ no auto-negotiate speed

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no auto-negotiate <P-1> speed <P-1> [<P-2>]

39.2.2 auto-negotiate duplex

Additionally, enter the duplex mode to be used for advertise capabilities.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-negotiate <P-1> duplex <P-1>

Parameter	Value	Meaning
P-1	full	Full-Duplex.
	half	Half-Duplex.

■ no auto-negotiate duplex

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no auto-negotiate <P-1> duplex <P-1>

39.2.3 auto-negotiate reset

Reset the advertisement capabilities to the default value of locally available bits.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-negotiate <P-1> reset

39.2.4 auto-negotiate advertise

Advertise a possible auto-negotiation capability.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-negotiate <P-1> advertise <P-1>

Parameter	Value	Meaning
P-1	xxx_hmcliBitList_Aut onegCapabilities_co mmand	???

■ no auto-negotiate advertise

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no auto-negotiate <P-1> advertise <P-1>

39.3 auto-power-down

39.3.1 auto-power-down

Set the auto-power-down mode on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: auto-power-down <P-1>

Parameter	Value	Meaning
P-1	auto-power-save	The port goes in a low power mode.
	no-power-save	The port does not use the automatic power save mode.

39.4 cable-crossing

39.4.1 cable-crossing

Cable crossing settings on the interface. The cable crossing settings have no effect if auto-negotiation is enabled. In this case cable crossing is always set to auto. Cable crossing is set to the value chosen by the user if auto-negotiation is disabled.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: cable-crossing <P-1>

Parameter	Value	Meaning
P-1	mdi	The port does not use the crossover mode.
	mdix	The port uses the crossover mode.
	auto-mdix	The port uses the auto crossover mode.

39.5 linktraps

39.5.1 linktraps

Enable/disable link up/down traps on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: linktraps

- no linktraps
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no linktraps

39.6 link-loss-alert

Configure Link Loss Alert on the interface.

39.6.1 link-loss-alert operation

Enable or disable Link Loss Alert on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: link-loss-alert operation

- no link-loss-alert operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no link-loss-alert operation

39.7 speed

39.7.1 speed

Sets the speed and duplex setting for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: speed <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	10	10 MBit/s.
	100	100 MBit/s.
	1000	1000 MBit/s.
P-2	full	full duplex.
	half	half duplex.

39.8 name

39.8.1 name

Set or remove a descriptive name for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: name <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

39.9 power-state

39.9.1 power-state

Enable or disable the power state on the interface. The interface power state settings have no effect if the interface admin state is enabled.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: power-state

■ no power-state

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no power-state

39.10 mac-filter

39.10.1 mac-filter

static mac filter configuration

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac-filter <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	1..4042	Enter the VLAN ID.

■ no mac-filter

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mac-filter <P-1> <P-2>

39.11 led-signaling

Enable or disable Port LED signaling.

39.11.1 led-signaling operation

Enable or disable Port LED signaling.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: led-signaling operation

■ no led-signaling operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no led-signaling operation

39.12 track

Set track parameters.

39.12.1 track if-status add

Set tracking object for interface status.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: track if-status add <P-1>

Parameter	Value	Meaning
P-1	string	Track instance.

39.12.2 track if-status delete

Delete tracking object for interface status.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: track if-status delete

39.13 show

Display device options and settings.

39.13.1 show port

Display the interface parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

39.13.2 show auto-negotiation

Display the interface auto-negotiation parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show auto-negotiation [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

39.14 show

Display device options and settings.

39.14.1 show link-loss-alert

Display the link-loss-alert parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show link-loss-alert [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

39.15 show

Display device options and settings.

39.15.1 show led-signaling operation

Display the port LED signaling operation.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show led-signaling operation

40 Interface Statistics

40.1 utilization

Configure the interface utilization parameters.

40.1.1 utilization control-interval

Add interval time to monitor the bandwidth utilization of the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization control-interval <P-1>

Parameter	Value	Meaning
P-1	1..3600	Add interval time to monitor the bandwidth utilization.

40.1.2 utilization alarm-threshold lower

Lower threshold value

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization alarm-threshold lower <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold lower value for monitoring bandwidth utilization in hundredths of a percent.

40.1.3 utilization alarm-threshold upper

Upper threshold value

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization alarm-threshold upper <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold upper value for monitoring bandwidth utilization in hundredths of a percent.

40.1.4 utilization ingress control-interval

Add interval time to monitor the bandwidth utilization of the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization ingress control-interval <P-1>

Parameter	Value	Meaning
P-1	1..3600	Add interval time to monitor the bandwidth utilization.

40.1.5 utilization ingress alarm-threshold lower

Lower threshold value for ingress

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization ingress alarm-threshold lower <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold lower value for monitoring bandwidth utilization in hundredths of a percent.

40.1.6 utilization ingress alarm-threshold upper

Upper threshold value for ingress

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization ingress alarm-threshold upper <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold upper value for monitoring bandwidth utilization in hundredths of a percent.

40.1.7 utilization egress control-interval

Add interval time to monitor the bandwidth utilization of the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization egress control-interval <P-1>

Parameter	Value	Meaning
P-1	1..3600	Add interval time to monitor the bandwidth utilization.

40.1.8 utilization egress alarm-threshold lower

Lower threshold value for egress

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization egress alarm-threshold lower <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold lower value for monitoring bandwidth utilization in hundredths of a percent.

40.1.9 utilization egress alarm-threshold upper

Upper threshold value for egress

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: utilization egress alarm-threshold upper <P-1>

Parameter	Value	Meaning
P-1	0..10000	Add alarm threshold upper value for monitoring bandwidth utilization in hundredths of a percent.

40.2 clear

Clear several items.

40.2.1 clear port-statistics

Clear all statistics counter.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear port-statistics

40.3 show

Display device options and settings.

40.3.1 show interface counters

Display the interface counters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show interface counters

40.3.2 show interface layout

Display the interface layout of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show interface layout

40.3.3 show interface utilization

Display the interface utilization.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show interface utilization [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

40.3.4 show interface statistics

Display the summary interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show interface statistics [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

40.3.5 show interface ether-stats

Display the detailed interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show interface ether-stats [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

41 Intern

41.1 help

Display the help text for various special keys.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** help

41.2 logout

Exit this session.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** any
- ▶ **Format:** logout

41.3 history

Display a list of previously run commands.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** history

41.4 vlan

Enter VLAN database mode.

41.4.1 vlan database

Enter VLAN database mode.

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** vlan database

41.5 vlan-mode

41.5.1 vlan-mode

Enter VLAN Configuration Mode.

- ▶ **Mode:** Global Config Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** vlan-mode <P-1>

Parameter	Value	Meaning
P-1	all	Select all VLAN configured.
	vlan	Enter single VLAN.
	vlan range	Enter VLAN range separated by hyphen e.g 1-4.
	vlan list	Enter VLAN list separated by comma e.g 2,4,6,... .
	complex range	Enter VLAN range and several VLAN separated by comma for a list and hyphen for ranges e.g 2-4,6-9,11.

41.6 exit

Exit from vlan mode.

- ▶ Mode: VLAN Mode
- ▶ Privilege Level: Operator
- ▶ Format: exit

41.7 end

Exit to exec mode.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: end

41.8 serviceshell

Enter system mode.

41.8.1 serviceshell start

Start serviceshell prompt

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell start

41.8.2 serviceshell debug

Additional service functions.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell debug <P-1>

Parameter	Value	Meaning
P-1	switch	Start switch debug shell
	ifconfig	Start Linux ifconfig
	osapi-debug	Start osapi debug functions.
	hw-port-reg	Display the hardware port register.
	hw-system-reg	Display the hardware system register.
	hw-sw-temperature	Display the hardware switch temperature register.
	interruptTestAll	Activate all kind of logic interrupts for testing

41.8.3 serviceshell boot fastboot

Enable/disable fastboot

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell boot fastboot <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

41.8.4 serviceshell boot test-mark

Start/clear all test mark.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell boot test-mark <P-1>

Parameter	Value	Meaning
P-1	start	Start mark test
	clear-all	Clear all mark test

41.8.5 serviceshell boot test-reset-params

Set a bootparameter invalid in a parameter block

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell boot test-reset-params <P-1>

Parameter	Value	Meaning
P-1	PARAM_BOOT_MAI	Set a parameter invalid in a parameter block.
	N_SECTION	
	PARAM_BOOT_IMA	Set a parameter invalid in a parameter block.
	GE_START_0	
	PARAM_BOOT_IMA	Set a parameter invalid in a parameter block.
	GE_START_1	
	PARAM_BOOT_IMA	Set a parameter invalid in a parameter block.
	GE_START_2	
	PARAM_BOOT_IMA	Set a parameter invalid in a parameter block.
	GE_START_3	

41.8.6 serviceshell boot test-print

Display the device tree information.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell boot test-print <P-1>

Parameter	Value	Meaning
P-1	struct	Print boot structure

41.8.7 serviceshell deactivate

Disable the service shell access permanently (Cannot be undone).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell deactivate

41.9 serviceshell-f

Enter system mode.

41.9.1 serviceshell-f deactivate

Disable the service shell access permanently (Cannot be undone).

- ▶ Mode: Factory Mode
- ▶ Privilege Level: Administrator
- ▶ Format: serviceshell-f deactivate

41.10 traceroute

Trace route to a specified host.

41.10.1 traceroute maxttl

Set max TTL value.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: traceroute <P-1> maxttl <P-2> [inittttl <P-3>] [interval <P-4>] [count <P-5>] [size <P-6>] [port <P-7>]
- [inittttl]: Initial TTL value.
[interval]: Timeout until probe failure.
[count]: Number of probes for each TTL.
[size]: Size of payload in bytes.
[port]: UDP destination port.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..255	Enter a number in the given range.

Parameter	Value	Meaning
P-3	0..255	Enter a number in the given range.
P-4	1..60	Enter a number in the given range.
P-5	1..10	Enter a number in the given range.
P-6	0..65507	Enter a number in the given range.
P-7	1..65535	Enter port number between 1 and 65535

41.11 traceroute

Trace route to a specified host.

41.11.1 traceroute source

Source address for traceroute command.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: traceroute <P-1> source <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

41.12 reboot

Reset the device (cold start).

41.12.1 reboot after

Schedule reboot after specified time.

- ▶ Mode: All Privileged Modes
- ▶ Privilege Level: any
- ▶ Format: reboot after <P-1>

Parameter	Value	Meaning
P-1	0..2147483	Enter Seconds Between 0 to 2147483. Setting 0 will clear scheduled Reboot if configured.

41.13 ping

Send ICMP echo packets to a specified IP address.

41.13.1 ping count

Number of retries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: ping <P-1> count <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..255	Enter a number in the given range.

41.14 ping

Send ICMP echo packets to a specified host or IP address.

41.14.1 ping source

Source address for ping command.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** ping <P-1> source <P-2> [count <P-3>]
[count]: Number of retries.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	1..255	Enter a number in the given range.

41.15 show

Display device options and settings.

41.15.1 show reboot

Display the configured reboot in seconds.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show reboot

41.15.2 show serviceshell

Display the service shell access.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show serviceshell

42 Digital IO Module

42.1 digital-input

Digital Input related configuration.

42.1.1 digital-input admin-state

Enable or disable the polling for digital inputs.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: digital-input admin-state
- no digital-input admin-state
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-input admin-state

42.1.2 digital-input refresh-interval

Set refresh interval in milliseconds for digital inputs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-input refresh-interval <P-1>

Parameter	Value	Meaning
P-1	1000..10000	Refresh interval in milliseconds.

42.1.3 digital-input log-event io

Configure a single IO port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-input log-event io <P-1>

Parameter	Value	Meaning
P-1	slot/input	Enter a Digital IO module input in slot/input format.
	MU/input	Enter a Digital IO input on the power supply module in MU/input format.

- no digital-input log-event io
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-input log-event io <P-1>

42.1.4 digital-input log-event all

Configure all IO ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-input log-event all

- no digital-input log-event all
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-input log-event all

42.1.5 digital-input snmp-trap io

Configure a single IO port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-input snmp-trap io <P-1>

Parameter	Value	Meaning
P-1	slot/input	Enter a Digital IO module input in slot/input format.
	MU/input	Enter a Digital IO input on the power supply module in MU/input format.

- no digital-input snmp-trap io
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-input snmp-trap io <P-1>

42.1.6 digital-input snmp-trap all

Configure all IO ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-input snmp-trap all

- no digital-input snmp-trap all
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-input snmp-trap all

42.2 digital-output

Digital Output related configuration

42.2.1 digital-output admin-state

Enable or disable the polling for digital outputs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output admin-state

- no digital-output admin-state
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-output admin-state

42.2.2 digital-output refresh-interval

Set refresh interval in milliseconds for digital outputs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output refresh-interval <P-1>

Parameter	Value	Meaning
P-1	1000..10000	Refresh interval in milliseconds.

42.2.3 digital-output retry-count

Set the number of retry counts for setting digital outputs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output retry-count <P-1>

Parameter	Value	Meaning
P-1	1..10	Retry count for digital outputs.

42.2.4 digital-output log-event io

Configure an IO port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output log-event io <P-1>

Parameter	Value	Meaning
P-1	slot/output	Enter a Digital IO module output in slot/output format.
	MU/output	Enter a Digital IO output on the power supply module in MU/output format.

- no digital-output log-event io
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-output log-event io <P-1>

42.2.5 digital-output log-event all

Configure all IO ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output log-event all

- no digital-output log-event all
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-output log-event all

42.2.6 digital-output snmp-trap io

Configure an IO port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output snmp-trap io <P-1>

Parameter	Value	Meaning
P-1	slot/output	Enter a Digital IO module output in slot/output format.
	MU/output	Enter a Digital IO output on the power supply module in MU/output format.

- no digital-output snmp-trap io
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-output snmp-trap io <P-1>

42.2.7 digital-output snmp-trap all

Configure all IO ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output snmp-trap all

- no digital-output snmp-trap all
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no digital-output snmp-trap all

42.2.8 digital-output mirror io

Mirror a single IO port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: digital-output mirror io <P-1> disable from <P-2> <P-3>

disable: Disable Mirroring on this output port.

from: Enable Mirroring on this output port.

Parameter	Value	Meaning
P-1	slot/output	Enter a Digital IO module output in slot/output format.
	MU/output	Enter a Digital IO output on the power supply module in MU/output format.
P-2	a.b.c.d	a.b.c.d Single IPv4 address.
	a.b.c.d:n	a.b.c.d:n IPv4 address with port.
	[a:b:c:d:e:f:g:h]	[a:b:c:d:e:f:g:h] Single IPv6 address.
	[a:b:c:d:e:f:g:h]:n	[a:b:c:d:e:f:g:h]:n IPv6 address with port.

Parameter	Value	Meaning
P-3	slot/input	Enter a Digital IO module input in slot/input format.
	MU/input	Enter a Digital IO input on the power supply module in MU/input format.

42.3 show

Display device options and settings.

42.3.1 show digital-input config

Display the global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show digital-input config

42.3.2 show digital-input io

Display the details about a single IO input port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show digital-input io

42.3.3 show digital-output config

Display the global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show digital-output config

42.3.4 show digital-output io

Display the details about a single IO output port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show digital-output io

43 Open Shortest Path First (OSPF)

43.1 ip

Set IP parameters.

43.1.1 ip ospf area

Administer the OSPF areas. An area is a sub-division of an OSPF autonomous system. You identify an area by an area-id. OSPF networks, routers, and links that have the same area-id form a logical set.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ip ospf area <P-1> range add <P-2> <P-3> <P-4> modify <P-5> <P-6> <P-7> <P-8> delete <P-9> <P-10> <P-11> add delete stub add <P-12> modify <P-13> summarylsa <P-14> default-cost <P-15> delete <P-16> virtual-link add <P-17> delete <P-18> modify <P-19> authentication type <P-20> key <P-21> key-id <P-22> hello-interval <P-23> dead-interval <P-24> transmit-delay <P-25> retransmit-interval <P-26> nssa add <P-27> delete <P-28> modify translator role <P-29> stability-interval <P-30> summary no-redistribute default-info originate [metric <P-31>] [metric-type <P-32>]

range: Configure the range for the area. You summarize the networks within this range into a single routing domain.

add: Create an area.

modify: Modify the parameters of an existing area.

delete: Delete a specific area.

add: Create a new area.

delete: Delete an existing area.

stub: Configure the preferences for a stub area. You shield stub areas from external route advertisements, but the area receives advertisements from networks that belong to other areas of the same autonomous system.

add: Create a stub area. The command also allows you to convert an existing area to a stub area.

modify: Modify the stub area parameters.

summarylsa: Configure the summary LSA mode for a stub area. When enabled, the router both summarizes and propagates summary LSAs.

default-cost: Set the default cost for the stub area.

delete: Remove a stub area. After removal, the area receives external route advertisements.

virtual-link: Configure a virtual link. You use the virtual link to connect the router to the backbone area (0.0.0.0) through a non-backbone area or to connect two parts of a partitioned backbone area (0.0.0.0) through a non-backbone area.

add: Add a virtual neighbor.

delete: Delete a virtual neighbor.

modify: Modify the parameters of a virtual neighbor.

authentication: Configure the authentication type. The device authenticates the OSPF protocol exchanges in the OSPF packet header which includes an authentication type field.

type: Configure the authentication type. Authentication types are 0 for null authentication, 1 for simple password authentication, and 2 for cryptographic authentication.

key: Configure the authentication key.

key-id: Configure the authentication key-id for md5 authentication. This field identifies the algorithm and secret key used to create the message digest appended to the OSPF packet.

hello-interval: Configure the OSPF hello-interval for the virtual link, in seconds. The hello timer controls the time interval between sending two consecutive hello packets. Set this value to the same hello-interval value of the virtual neighbors.

dead-interval: Configure the OSPF dead-interval for the virtual link, in seconds. If the timer expires without the router receiving hello packets from a virtual neighbor, the router declares the neighbor router as down. Set the timer to at least four times the value of the hello-interval.

transmit-delay: Configure the OSPF transmit-delay for the virtual link, in seconds. Transmit delay is the time that you estimate it takes to transmit a link-state update packet over the virtual link.

retransmit-interval: Configure the OSPF retransmit-interval for the virtual link, in seconds. The retransmit interval is the time between two consecutive link-state advertisement transmissions. Link-state advertisements contain such information as database descriptions and link-state request packets for adjacencies belonging to virtual link.

nssa: Configure a NSSA(Not-So-Stubby-Area).

add: Add a NSSA.

delete: Delete a NSSA.

modify: Modify the parameters of a NSSA.

translator: Configure the NSSA translator related parameters.

role: Configure the NSSA translator role.

stability-interval: Configure the translator stability interval for the NSSA, in seconds.

summary: Configure the import summary for the specified NSSA.

no-redistribute: Configure route redistribution for the specified NSSA.

default-info: Configure the nssa default information origination parameters.

originate: Configuration whether a Type-7 LSA should be originated into the NSSA.

[metric]: Configure the metric for the NSSA.

[metric-type]: Configure the metric type for default information.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	summary-link	Configure summary links LSDB type optional mode.
	nssa-external-link	Configure nssa external link LSDB type optional mode.
P-3	A.B.C.D	IP address.
P-4	A.B.C.D	IP address.
P-5	summary-link	Configure summary links LSDB type optional mode.
	nssa-external-link	Configure nssa external link LSDB type optional mode.
P-6	A.B.C.D	IP address.
P-7	A.B.C.D	IP address.
P-8	advertise	Set as advertise.
	do-not-advertise	Set as do-not-advertise.
P-9	summary-link	Configure summary links LSDB type optional mode.
	nssa-external-link	Configure nssa external link LSDB type optional mode.
P-10	A.B.C.D	IP address.
P-11	A.B.C.D	IP address.
P-12	0	Configure the TOS (0 is for Normal Service).
P-13	0	Configure the TOS (0 is for Normal Service).
P-14	no-area-summary	Disable the router from sending area link state advertisement summaries.
	send-area-summary	Enable the router to send area link state advertisement summaries. The router floods LSAs within the area using multicast. Every topology change starts a new flood of LSAs.
P-15	0..16777215	Configure the default cost.
P-16	0	Configure the TOS (0 is for Normal Service).
P-17	A.B.C.D	IP address.
P-18	A.B.C.D	IP address.
P-19	A.B.C.D	IP address.
P-20	none	Configure the authentication type as none (Key and key ID is not required).
	simple	Configure the authentication type as simple (Key ID is not required).
	md5	Configure the authentication type as md5 for the interface.
P-21	string	<key> Configure the authentication key.
P-22	0..255	Enter a number in the given range.
P-23	1..65535	Enter a number between 1 and 65535
P-24	1..65535	Enter a number between 1 and 65535
P-25	0..3600	Enter a number in the given range.
P-26	0..3600	Enter a number in the given range.
P-27	import-nssa	Configure the area as NSSA only.
P-28	import-external	Change the area to support external LSAs also.
P-29	always	Configure the NSSA translator role as always. When used as a border router, the router translates LSAs regardless of the translator states of the other NSSA border routers.
	candidate	Configure the NSSA translator role as a candidate. When used as a border router, the router participates in the translator election process. The router maintains a list of reachable NSSA border routers.
P-30	0..65535	Enter a number between 0 and 65535
P-31	1..16777214	Configure the metric value.
P-32	ospf-metric	Set the metric type as ospf Metric.
	comparable-cost	Set the metric type as comparable cost.
	non-comparable	Set the metric type as non-comparable.

- no ip ospf area
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf area <P-1> range add modify delete add delete stub add modify summarylsa default-cost delete virtual-link add delete modify authentication type key key-id hello-interval dead-interval transmit-delay retransmit-interval nssa add delete modify translator role stability-interval summary no-redistribute default-info originate [metric] [metric-type]

43.1.2 ip ospf trapflags all

Set all trapflags at once.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf trapflags all <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no ip ospf trapflags all
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf trapflags all <P-1>

43.1.3 ip ospf operation

Enable or disable the OSPF admin mode. When enabled, the device initiates the OSPF process if the OSPF function is active on at least one interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf operation

- no ip ospf operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf operation

43.1.4 ip ospf 1583compatability

Enable or disable the 1583compatibility for calculating routes external to the autonomous system. When enabled, the router is compatible with the preference rules defined in RFC1583, section 16.4.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf 1583compatability

- no ip ospf 1583compatability
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf 1583compatability

43.1.5 ip ospf default-metric

Configure the default metric for re-distributed routes, when OSPF redistributes routes from other protocols.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf default-metric <P-1>

Parameter	Value	Meaning
P-1	1..16777214	Configure the default metric for redistributed routes.

- no ip ospf default-metric
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf default-metric <P-1>

43.1.6 ip ospf router-id

Configure the router ID to uniquely identify this OSPF router in the autonomous system. If a tie occurs during the designated router election, the router with the higher router ID is the designated router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf router-id <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

43.1.7 ip ospf external-lsdb-limit

Configure the OSPF external lsdb limitation, which is the maximum number of non-default AS-external-LSA entries that the router stores in the link-state database. When the value -1 is configured, you disable the limitation.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf external-lsdb-limit <P-1>

Parameter	Value	Meaning
P-1	-1.2147483647	Configure the external lsdb limit.

43.1.8 ip ospf exit-overflow

Configure the OSPF exit overflow interval, in seconds. After the timer expires the router will attempt to leave the overflow-state. To disable the exit overflow interval function set the value to 0.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf exit-overflow <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	Configure the exit overflow interval.

43.1.9 ip ospf maximum-path

Configure the maximum number of paths that OSPF reports.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf maximum-path <P-1>

Parameter	Value	Meaning
P-1	1..4	Set the maximum path.

43.1.10 ip ospf spf-delay

Configure the SPF delay, in seconds. The Shortest Path First (SPF) delay is the time that the device waits for the network to stabilize before calculating the shortest path tree, after a topology change.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf spf-delay <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

43.1.11 ip ospf spf-holdtime

Configure the minimum time between two consecutive SPF calculations, in seconds.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf spf-holdtime <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a number between 0 and 65535

43.1.12 ip ospf auto-cost

Set the auto cost reference bandwidth of the router interfaces for ospf metric calculations. The default reference bandwidth is 100 Mbps.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip ospf auto-cost <P-1>

Parameter	Value	Meaning
P-1	1..4294967	Configure the auto cost for OSPF calculation.

43.1.13 ip ospf distance intra

Enter the preference type as intra. Use intra-area routing when the device routes packets solely within an area, such as an internal router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf distance intra <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter the value.

43.1.14 ip ospf distance inter

Enter the preference type as inter. Use inter-area routing when the device routes packets into or out of an area, such as an area border router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf distance inter <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter the value.

43.1.15 ip ospf distance external

Enter the preference type as external. Use external-area routing when the device routes packets into or out of an autonomous system, such as an autonomous system boundary router (ASBR).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf distance external <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter the value.

43.1.16 ip ospf re-distribute

Configure the OSPF route re-distribution. An ASBR is able to translate information from other OSPF processes in separate areas and routes from other sources, such as static routes or other dynamic routing protocols, into the OSPF protocol.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf re-distribute <P-1> [metric <P-2>] [metric-type <P-3>] [tag <P-4>] [subnets <P-5>]

[metric]: Configure the OSPF route re-distribution metric parameters.

[metric-type]: Configure the OSPF route redistribution metric-type.

[tag]: Configure the OSPF route redistribution tag parameters.

[subnets]: Allow the router to redistribute subnets into OSPF.

Parameter	Value	Meaning
P-1	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	rip	Select the source protocol as RIP.
P-2	0..16777214	Configure the metric.
P-3	1..2	Configure the metric type.
P-4	0..4294967295	Configure the tag.
P-5	enable	Enable the option.
	disable	Disable the option.

■ no ip ospf re-distribute

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip ospf re-distribute <P-1> [metric] [metric-type] [tag] [subnets]

43.1.17 ip ospf distribute-list

Configure the distribute list for the routes from other source protocols.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf distribute-list <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	out	Configure as out to re-distribute routes with ACL rules

Parameter	Value	Meaning
P-2	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	rip	Select the source protocol as RIP.
P-3	<1000..1099>	Enter the access list number.

- no ip ospf distribute-list
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf distribute-list <P-1> <P-2> <P-3>

43.1.18 ip ospf default-info originate

Originate the OSPF default information.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip ospf default-info originate [always] [metric <P-1>] [metric-type <P-2>]
- [always]: Always advertise the 0.0.0.0/0.0.0.0 route information.
 [metric]: Configure the metric for default information.
 [metric-type]: Configure the metric type for default information.

Parameter	Value	Meaning
P-1	1..16777214	Configure the metric value.
P-2	external-type1	Set the metric type for default information as external type-1. The type 1 value sets the metric to the sum of the internal and external OSPF metrics.
	external-type2	Set the metric type for default information as external type-2. The type 2 value sets the metric to the sum of external OSPF metrics from the source AS to the destination AS.

- no ip ospf default-info originate
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf default-info originate [always] [metric <P-1>] [metric-type]

43.2 ip

IP interface commands.

43.2.1 ip ospf operation

Enable or disable OSPF on port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf operation

- no ip ospf operation
 - Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf operation

43.2.2 ip ospf area-id

Configure the area ID that uniquely identifies the area to which the interface is connected.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf area-id <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

43.2.3 ip ospf link-type

Configure the OSPF link type.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf link-type <P-1>

Parameter	Value	Meaning
P-1	broadcast	Configure the link-type as broadcast for the interface. In broadcast networks, routers discover their neighbors dynamically using the OSPF hello protocol.
	nbma	Configure the link-type as Non-Broadcast Multi-Access for the interface. The nbma mode, emulates OSPF operation over a broadcast network. The nbma mode is the most efficient way to run OSPF over non-broadcast networks, both in terms of the LSDB size and the amount of routing protocol traffic. However, this mode requires direct communication between every router in the nbma network.
	point-to-point	Configure the link-type as point-to-point for the interface. Use the point-to-point link-type in a network that joins a single pair of routers.
	point-to-multipoint	Configure the link-type as point-to-multipoint for the interface. In the point-to-multipoint mode, OSPF treats each router-to-router link over non-broadcast networks as if they were point-to-point links.

43.2.4 ip ospf priority

Configure the OSPF router priority which the router uses in multi-access networks for the designated router election algorithm. The router with the higher router priority is the designated router. A value of 0 declares the router as ineligible for designated router elections.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf priority <P-1>

Parameter	Value	Meaning
P-1	0..255	Configure the priority.

43.2.5 ip ospf transmit-delay

Configure the OSPF transmit-delay for the interface, in seconds. The transmit-delay is the time that you estimate it takes to transmit a link-state update packet over the interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf transmit-delay <P-1>

Parameter	Value	Meaning
P-1	0..3600	Enter a number in the given range.

43.2.6 ip ospf retransmit-interval

Configure the OSPF retransmit-interval for the interface, in seconds. The retransmit-interval is the interval after which link-state advertisements containing database description and link-state request packets, are re-transmitted for adjacencies belonging to this interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf retransmit-interval <P-1>

Parameter	Value	Meaning
P-1	0..3600	Enter a number in the given range.

43.2.7 ip ospf hello-interval

Configure the OSPF hello-interval for the interface, in seconds. The hello timer controls the time interval between two consecutive hello packets. Set this value to the same hello-interval value of the neighbor.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf hello-interval <P-1>

Parameter	Value	Meaning
P-1	1..65535	Enter a number between 1 and 65535

43.2.8 ip ospf dead-interval

Configure the OSPF dead-interval for the interface, in seconds. If the timer expires without the router receiving hello packets from the neighbor, the router declares the neighbor router as down. Set the timer to at least four times the value of the hello-interval.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip ospf dead-interval <P-1>

Parameter	Value	Meaning
P-1	1..65535	Enter a number between 1 and 65535

43.2.9 ip ospf cost

Configure the OSPF cost for the interface. The cost of a specific interface indicates the overhead required to send packets across the link. If set to 0, OSPF calculates the cost from the reference bandwidth and the interface speed.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf cost <P-1>

Parameter	Value	Meaning
P-1	<1..65535>	Configure the cost for the specified interface.
	auto	Automatic calculation from reference bandwidth and link speed.

43.2.10 ip ospf mtu-ignore

Enable/Disable OSPF MTU mismatch on interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip ospf mtu-ignore
- no ip ospf mtu-ignore
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf mtu-ignore

43.2.11 ip ospf authentication type

Configure authentication type.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf authentication type <P-1>

Parameter	Value	Meaning
P-1	none	Configure the authentication type as none (Key and key ID is not required).
	simple	Configure the authentication type as simple (Key ID is not required).
	md5	Configure the authentication type as md5 for the interface.

43.2.12 ip ospf authentication key

Configure authentication key.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf authentication key <P-1>

Parameter	Value	Meaning
P-1	string	<key> Configure the authentication key.

43.2.13 ip ospf authentication key-id

Configure authentication key-id for md5 authentication.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip ospf authentication key-id <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

43.2.14 ip ospf fast-hello

Enable or disable fast hello mode on port. When enabled, hello packets would be sent out on the interface for every 250ms. The dead interval needs to be re-configured accordingly for faster convergence.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip ospf fast-hello
- no ip ospf fast-hello
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip ospf fast-hello

43.3 show

Display device options and settings.

43.3.1 show ip ospf global

Display the OSPF global configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf global

43.3.2 show ip ospf area

Display the OSPF area related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf area [<P-1>]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

43.3.3 show ip ospf stub

Display the OSPF stub area related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf stub

43.3.4 show ip ospf database internal

Display the internal LSA database information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf database internal

43.3.5 show ip ospf database external

Display the external LSA database information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf database external

43.3.6 show ip ospf range

Display the OSPF area range information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf range

43.3.7 show ip ospf interface

Display the OSPF interface related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

43.3.8 show ip ospf virtual-link

Display the OSPF virtual-link related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf virtual-link <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

43.3.9 show ip ospf virtual-neighbor

Display the OSPF Virtual-link neighbor information

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf virtual-neighbor

43.3.10 show ip ospf neighbor

Display the OSPF neighbor related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf neighbor [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

43.3.11 show ip ospf statistics

Display the OSPF statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf statistics

43.3.12 show ip ospf re-distribute

Display the OSPF re-distribute related information

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf re-distribute <P-1>

Parameter	Value	Meaning
P-1	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	rip	Select the source protocol as RIP.

43.3.13 show ip ospf nssa

Display the OSPF NSSA related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf nssa <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

43.3.14 show ip ospf route

Display the OSPF routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip ospf route

44 Routing Information Protocol (RIP)

44.1 ip

Set IP parameters.

44.1.1 ip rip operation

Enable or disable the RIP admin mode.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip rip operation
-
- no ip rip operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip rip operation

44.1.2 ip rip auto-summary

Enable or disable the RIP auto summarization mode on the router.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip rip auto-summary
-
- no ip rip auto-summary
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip rip auto-summary

44.1.3 ip rip default-info originate

Originate the RIP default information.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip rip default-info originate
-
- no ip rip default-info originate
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip rip default-info originate

44.1.4 ip rip default-metric

Configure the default metric for redistributed routes, when RIP redistributes routes from other protocols.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip default-metric <P-1>

Parameter	Value	Meaning
P-1	1..15	Enter the metric.

- no ip rip default-metric
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip rip default-metric <P-1>

44.1.5 ip rip distance

Configure the route preference for RIP routes (administrative distance).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip distance <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter the distance.

44.1.6 ip rip host-route-accept

Configure the RIP host route acceptance mode on the router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip host-route-accept

■ no ip rip host-route-accept

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip rip host-route-accept

44.1.7 ip rip distribute-list

Configure the distribute list for the routes from other source protocols.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip distribute-list <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	out	Configure as out to re-distribute routes with ACL rules
P-2	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	ospf	Select the source protocol as OSPF.
P-3	<1000..1099>	Enter the access list number.

■ no ip rip distribute-list

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip rip distribute-list <P-1> <P-2> <P-3>

44.1.8 ip rip re-distribute

Configure the RIP route redistribution.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip re-distribute <P-1> [metric <P-2>] [internal <P-3>] [external-1 <P-4>] [external-2 <P-5>] [nssa-external-1 <P-6>] [nssa-external-2 <P-7>]

[metric]: Configure the RIP route re-distribution metric parameters.

[internal]: Configure the router to re-distribute OSPF internal routes to other routers using RIP. OSPF enters internal routes in the routing table for routes originating within OSPF. In order to re-distribute the routing table with this value, first configure and enable ospf.

[external-1]: Configure the router to re-distribute OSPF external-1 routes to other routers using RIP. OSPF external type 1 entries originate from other protocols. External type 1 routes include the total cost, internal and external, of the route. In order to re-distribute the routing table with this value, first configure and enable ospf.

[external-2]: Configure the router to re-distribute OSPF external-2 routes to other routers using RIP. OSPF external type 2 entries originate from other routing protocols or are static routes. External type 2 routes contain solely the external cost of the route. In order to re-distribute the routing table with this value, first configure and enable ospf.

[nssa-external-1]: Configure the router to re-distribute OSPF nssa-external-1 routes to other routers using RIP. OSPF nssa external type 1 entries originate from other protocols and contain solely Not-So-Stubby-Area routes. External type 1 routes include the total cost, internal and external, of the route. In order to re-distribute the routing table with this value, first configure and enable ospf.

[nssa-external-2]: Configure the router to re-distribute OSPF nssa-external-2 routes to other routers using RIP. OSPF nssa external type 2 entries originate from other protocols and contain solely Not-So-Stubby-Area routes. External type 2 routes include solely the internal cost of the route. In order to re-distribute the routing table with this value, first configure and enable ospf.

Parameter	Value	Meaning
P-1	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	ospf	Select the source protocol as OSPF.
P-2	1..15	Enter the metric.
P-3	enable	Enable the option.
	disable	Disable the option.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	enable	Enable the option.
	disable	Disable the option.
P-6	enable	Enable the option.
	disable	Disable the option.
P-7	enable	Enable the option.
	disable	Disable the option.

■ no ip rip re-distribute

Disable the option

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: no ip rip re-distribute <P-1> [metric <P-2>] [internal] [external-1] [external-2] [nssa-external-1] [nssa-external-2]

44.1.9 ip rip split-horizon

Configure the RIP split horizon operating mode on the router.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip rip split-horizon <P-1>

Parameter	Value	Meaning
P-1	none	Disable the split horizon
	simple	Configure the split horizon as simple
	poison-reverse	Configure the split horizon as poison-reverse

44.1.10 ip rip update-timer

Configure the RIP update timer on the router.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip rip update-timer <P-1>

Parameter	Value	Meaning
P-1	1..1000	Configure the update timer.

44.2 ip

IP interface commands.

44.2.1 ip rip authentication type

Configure the RIP authentication type.

► Mode: Interface Range Mode

► Privilege Level: Operator

► Format: ip rip authentication type <P-1>

Parameter	Value	Meaning
P-1	none	Configure the authentication type as none (Key and key ID is not required).
	simple	Configure the authentication type as simple (Key ID is not required).
	md5	Configure the authentication type as md5 for the interface.

44.2.2 ip rip authentication key

Configure the authentication key. Entering a key helps protect your network information such as routing tables from being tampered with.

► Mode: Interface Range Mode

► Privilege Level: Operator

► Format: ip rip authentication key <P-1>

Parameter	Value	Meaning
P-1	string	<key> Configure the authentication key.

44.2.3 ip rip authentication key-id

Configure authentication key-id for md5 authentication.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip authentication key-id <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

44.2.4 ip rip operation

Enable or disable RIP on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip operation
- no ip rip operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip rip operation

44.2.5 ip rip send-version

Configure the RIP version to send RIP updates on an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip send-version <P-1>

Parameter	Value	Meaning
P-1	none	Do not send RIP update on this interface.
	ripv1	Configure the send version type as ripv1.
	rip1c	Configure the send version type as rip1c.
	ripv2	Configure the send version type as ripv2.

44.2.6 ip rip receive-version

Configure the RIP version to receive RIP updates on an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip rip receive-version <P-1>

Parameter	Value	Meaning
P-1	ripv1	Configure the receive version type as ripv1.
	ripv2	Configure the receive version type as ripv2.
	both	Configure the receive version type as both.
	none	Do not receive RIP update on this interface.

44.3 show

Display device options and settings.

44.3.1 show ip rip global

Display the RIP global configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip rip global

44.3.2 show ip rip interface

Display the RIP interface related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip rip interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

44.3.3 show ip rip statistics global

Display the global statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip rip statistics global

44.3.4 show ip rip statistics interface

Display the interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip rip statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

44.3.5 show ip rip re-distribute

Display the RIP re-distribute related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip rip re-distribute <P-1>

Parameter	Value	Meaning
P-1	connected	Select the source protocol as connected.
	static	Select the source protocol as static.
	ospf	Select the source protocol as OSPF.

45 Virtual Router Redundancy Protocol (VRRP)

45.1 ip

Set IP parameters.

45.1.1 ip vrrp operation

Enables or disables VRRP globally on the device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp operation

■ no ip vrrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip vrrp operation

45.1.2 ip vrrp trap auth-failure

Enable or disable the sending of a trap if this router detects an authentication failure on any of its VRRP interfaces.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp trap auth-failure

■ no ip vrrp trap auth-failure

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip vrrp trap auth-failure

45.1.3 ip vrrp trap new-master

Enable or disable the sending of a trap if this router becomes new master for any of its VRRP interfaces.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp trap new-master

■ no ip vrrp trap new-master

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip vrrp trap new-master

45.1.4 ip vrrp domain

VRRP domain settings

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp domain <P-1> member-advertisement

member-advertisement: Enables or disables sending of advertisements for members of this domain.

Parameter	Value	Meaning
P-1	1..8	Enter a number in the given range.

■ no ip vrrp domain

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip vrrp domain <P-1> member-advertisement

45.2 ip

IP interface commands.

45.2.1 ip vrrp add

Create a new VRRP instance.

► **Mode:** Interface Range Mode

► **Privilege Level:** Operator

► **Format:** ip vrrp add <P-1> [priority <P-2>] [interval <P-3>] [preempt <P-4>] [advertisement-ip <P-5>] [preempt-delay <P-6>] [notify-ip <P-7>] [master-candidate <P-8>] [domain-id <P-9>] [domain-role <P-10>] [accept-mode <P-11>]

[priority]: Priority of the virtual router default 100

[interval]: Advertisement Interval in ms default 1000

[preempt]: Enables or disabled preempt mode ... default enabled

[advertisement-ip]: Advertisement ip address default 224.0.0.18

[preempt-delay]: Preemption delay default 0

[notify-ip]: Linkdown notification address default none

[master-candidate]: Master Candidate Address default 0.0.0.0

[domain-id]: Domain id default none

[domain-role]: Role within the domain default none

[accept-mode]: Accept ICMP Echo Requests default enabled

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	1..254	Enter a priority value.
P-3	100..25500	Enter a number in the given range.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	a.b.c.d	Ipv4 address.
P-6	0..65535	Enter a number between 0 and 65535.
P-7	a.b.c.d	Ipv4 address.
P-8	a.b.c.d	Ipv4 address.
P-9	1..8	Enter a number in the given range.
P-10	none	None
	member	Member
	supervisor	Supervisor
P-11	enable	Enable the option.
	disable	Disable the option.

45.2.2 ip vrrp modify

Modify parameters of a VRRP instance.

► **Mode:** Interface Range Mode

► **Privilege Level:** Operator

► **Format:** ip vrrp modify <P-1> [priority <P-2>] [interval <P-3>] [preempt <P-4>] [advertisement-ip <P-5>] [preempt-delay <P-6>] [notify-ip <P-7>] [master-candidate <P-8>] [domain-id <P-9>] [domain-role <P-10>] [accept-mode <P-11>]

[priority]: Priority of the virtual router

[interval]: Advertisement Interval in milliseconds

[preempt]: Enables or disabled preemption mode

[advertisement-ip]: Advertisement ip address

[preempt-delay]: Preemption delay

[notify-ip]: Linkdown notification address

[master-candidate]: The IP Address that shows as Master IP Address when this Virtual Router becomes Master

[domain-id]: Domain id

[domain-role]: Role within the domain

[accept-mode]: Accept ICMP Echo Requests

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	1..254	Enter a priority value.
P-3	100..25500	Enter a number in the given range.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	a.b.c.d	Ipv4 address.
P-6	0..65535	Enter a number between 0 and 65535.
P-7	a.b.c.d	Ipv4 address.

Parameter	Value	Meaning
P-8	a.b.c.d	Ipv4 address.
P-9	1..8	Enter a number in the given range.
P-10	none	None
	member	Member
	supervisor	Supervisor
P-11	enable	Enable the option.
	disable	Disable the option.

45.2.3 ip vrrp delete

Delete a VRRP instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp delete <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.

45.2.4 ip vrrp enable

Enable a VRRP instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp enable <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.

45.2.5 ip vrrp disable

Disable a VRRP instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp disable <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.

45.2.6 ip vrrp virtual-address add

Add a virtual address.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp virtual-address add <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	A.B.C.D	IP address.

45.2.7 ip vrrp virtual-address delete

Delete a virtual address.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp virtual-address delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	A.B.C.D	IP address.

45.2.8 ip vrrp track add

Add a tracking object to the vrrp instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp track add <P-1> <P-2> [decrement <P-3>]
[decrement]: Configure the decrement value. Default is 20

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	string	Track instance.
P-3	1..253	Enter the decrement value. The priority will be decremented by the configured value

45.2.9 ip vrrp track modify

Modify a tracking object to the vrrp instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp track modify <P-1> <P-2> decrement <P-3>
decrement: Configure the decrement value. Default is 20

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	string	Track instance.
P-3	1..253	Enter the decrement value. The priority will be decremented by the configured value

45.2.10 ip vrrp track delete

Delete a tracking object to the vrrp instance.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip vrrp track delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	Enter a virtual router ID.
P-2	string	Track instance.

45.3 show

Display device options and settings.

45.3.1 show ip vrrp interface

Display the parameters of one VRRP instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip vrrp interface [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..255	Enter a virtual router ID.

45.3.2 show ip vrrp global

Display the global VRRP parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip vrrp global

45.3.3 show ip vrrp domains

Display the VRRP domain table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip vrrp domains

46 Address Resolution Protocol (IP ARP)

46.1 ip

Set IP parameters.

46.1.1 ip arp add

Add a static arp entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp add <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	aa:bb:cc:dd:ee:ff	MAC address.

46.1.2 ip arp delete

Delete a static arp entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp delete <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

46.1.3 ip arp enable

Enable a static arp entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp enable <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

46.1.4 ip arp disable

Disable a static arp entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp disable <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

46.1.5 ip arp timeout

Configure ARP entry age-out time (in seconds).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp timeout <P-1>

Parameter	Value	Meaning
P-1	15..21600	Enter the arp response time.

46.1.6 ip arp response-time

Configure ARP request response timeout (in seconds).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp response-time <P-1>

Parameter	Value	Meaning
P-1	1..10	Enter the arp response time.

46.1.7 ip arp retries

Configure ARP count of maximum requests for retries.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp retries <P-1>

Parameter	Value	Meaning
P-1	0..10	Enter the arp max retries.

46.1.8 ip arp dynamic-renew

Configure if dynamic ARP Entries should be automatically renewed when they age out.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp dynamic-renew
- no ip arp dynamic-renew
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp dynamic-renew

46.1.9 ip arp selective-learning

Enables the Selective ARP Learning Mode on the router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip arp selective-learning
- no ip arp selective-learning
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip arp selective-learning

46.2 show

Display device options and settings.

46.2.1 show ip arp info

Display the ARP summary information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip arp info

46.2.2 show ip arp table

Display the ARP cache entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip arp table

46.2.3 show ip arp static

Display the static ARP entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip arp static

46.2.4 show ip arp entry

Display the ARP cache entry.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip arp entry <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

46.3 clear

Clear several items.

46.3.1 clear ip arp-cache

Clear the router's ARP table (cache).

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** `clear ip arp-cache [gateway]`
[gateway]: Also clear gateway ARP entries.

47 IP UDP Helper (IP Helper)

47.1 ip

Set IP parameters.

47.1.1 ip udp-helper operation

Enable or disable the IP helper and DHCP relay.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper operation
- no ip udp-helper operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip udp-helper operation

47.1.2 ip udp-helper server add

Add a global relay agent to process DHCP client requests and UDP broadcast packets received on any interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server add <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.1.3 ip udp-helper server delete

Delete a global relay agent.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.1.4 ip udp-helper server enable

Enable a global relay agent to process DHCP client requests and UDP broadcast packets received on any interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.1.5 ip udp-helper server disable

Disable a global relay agent from processing DHCP client requests and UDP broadcast packets received on any interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.1.6 ip udp-helper maxhopcount

Configure the DHCP relay maximum hop count.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper maxhopcount <P-1>

Parameter	Value	Meaning
P-1	1..16	Enter a number in the given range.

47.1.7 ip udp-helper minwaittime

Configure DHCP relay minimum wait time in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper minwaittime <P-1>

Parameter	Value	Meaning
P-1	0..100	Enter a number in the given range.

47.1.8 ip udp-helper cidoptmode

Enable or disable DHCP relay circuit id option mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper cidoptmode

■ no ip udp-helper cidoptmode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip udp-helper cidoptmode

47.2 ip

IP interface commands.

47.2.1 ip udp-helper server add

Add a relay agent to process DHCP client requests and UDP broadcast packets received on a specific interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server add <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.2.2 ip udp-helper server delete

Delete a relay agent from a specific interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip udp-helper server delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.2.3 ip udp-helper server enable

Enable a relay agent to process DHCP client requests and UDP broadcast packets received on a specific interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip udp-helper server enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.2.4 ip udp-helper server disable

Disable a relay agent from processing DHCP client requests and UDP broadcast packets received on a specific interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip udp-helper server disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	default	Port 0. Relay only dhcp, time, winnameserver, tacacs, dns,
	dhcp	tftp, netbios-ns and netbios-dgm.
	dns	Port 67
	isakmp	Port 53
	mobile-ip	Port 500
	winnameserver	Port 434
	netbios-dgm	Port 42
	netbios-ns	Port 138
	ntp	Port 137
	pim-auto-rp	Port 123
	rip	Port 496
	tacacs	Port 520
	tftp	Port 49
	time	Port 69
	<0..65535>	Port 37
		Port number
P-2	A.B.C.D	IP address.

47.3 show

Display device options and settings.

47.3.1 show ip udp-helper status

Display the IP helper and DHCP relay status information.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ip udp-helper status

47.3.2 show ip udp-helper global

Display the DHCP and UDP relays defined globally.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ip udp-helper global

47.3.3 show ip udp-helper interface

Display the DHCP and UDP relays defined for specific interfaces.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip udp-helper interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

47.3.4 show ip udp-helper statistics

Display the IP helper and DHCP relay statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip udp-helper statistics

47.4 clear

Clear several items.

47.4.1 clear ip udp-helper

Reset IP helper and DHCP relay statistics.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear ip udp-helper

48 IP Source Guard (IPSG)

48.1 ip

Set IP parameters.

48.1.1 ip source-guard binding add

This command creates a new static IPSG binding between a MAC address and an IP address, for a specific VLAN at a particular interface.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip source-guard binding add <P-1> <P-2> <P-3> <P-4> [<P-5>]

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	A.B.C.D	IP address.
P-3	slot no./port no.	
P-4	1..4042	Enter the VLAN ID.
P-5	active	Activate the option.
	inactive	Inactivate the option.

48.1.2 ip source-guard binding delete all

This command deletes all static IP Source Guard (IPSG) bindings (at all interfaces).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip source-guard binding delete all

48.1.3 ip source-guard binding delete interface

This command deletes all static IP Source Guard (IPSG) bindings, associated with a particular interface.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip source-guard binding delete interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

48.1.4 ip source-guard binding delete index

This command deletes one static IP Source Guard (IPSG) binding, associated with a MAC address, IP address, interface and VLAN.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip source-guard binding delete index <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	A.B.C.D	IP address.
P-3	slot no./port no.	
P-4	1..4042	Enter the VLAN ID.

48.1.5 ip source-guard binding mode

This command activates or deactivates a configured static IPSG binding.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip source-guard binding mode <P-1> <P-2> <P-3> <P-4> <P-5>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	A.B.C.D	IP address.
P-3	slot no./port no.	
P-4	1..4042	Enter the VLAN ID.
P-5	active	Activate the option.
	inactive	Inactivate the option.

48.2 clear

Clear several items.

48.2.1 clear ip source-guard bindings

This command clears all dynamic IPSPG bindings on all interfaces or on a specific interface.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear ip source-guard bindings [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

48.3 ip

IP interface commands.

48.3.1 ip source-guard mode

This command configures an interface for IP source guarding (IPSPG).

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip source-guard mode
-
- no ip source-guard mode
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip source-guard mode

48.3.2 ip source-guard verify-mac

This command configures an interface for additional MAC address verification, when performing IP source guarding (IPSPG). This option cannot be enabled unless IPSPG is enabled. Once it is enabled, it can only be disabled by disabling IPSPG at this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip source-guard verify-mac

48.4 show

Display device options and settings.

48.4.1 show ip source-guard interfaces

This command shows the IP Source Guard (IPSPG) status of all interfaces.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip source-guard interfaces

48.4.2 show ip source-guard bindings

This command displays the IPSPG binding entries from the static and/or dynamic bindings table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip source-guard bindings [<P-1>] [interface <P-2>] [vlan <P-3>]
[interface]: Restrict the output based on a specific interface.
[vlan]: Restrict the output based on VLAN.

Parameter	Value	Meaning
P-1	static	Restrict the output based on static bindings.
	dynamic	Restrict the output based on dynamic bindings.
P-2	slot no./port no.	
P-3	1..4042	Enter the VLAN ID.

49 IP Subnet VLAN

49.1 vlan

Creation and configuration of VLANS.

49.1.1 vlan association subnet

Configure Subnet association to VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan association subnet <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	1..4042	Enter the VLAN ID.

- no vlan association subnet
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no vlan association subnet <P-1> <P-2> <P-3>

49.2 show

Display device options and settings.

49.2.1 show vlan association subnet

Display the Subnet association to VLAN entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan association subnet [<P-1>]

Parameter	Value	Meaning
P-1	a.b.c.d-e.f.g.h	IP address and mask e.g. 192.168.1.1-255.255.255.0 .

50 Internet Protocol Version 4 (IPv4)

50.1 network

Configure the inband and outband connectivity.

50.1.1 network protocol

Select DHCP, BOOTP or none as the network configuration protocol.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network protocol <P-1>

Parameter	Value	Meaning
P-1	none	No network config protocol
	bootp	BOOTP
	dhcp	DHCP

50.1.2 network parms

Set network address, netmask and gateway

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network parms <P-1> <P-2> [<P-3>]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

50.1.3 network dhcp config-load

Enables/disables the DHCP options 4/42 (time servers) and 66/67 (Load config over TFTP on boot) on DHCP/BOOTP client.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network dhcp config-load <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

50.2 clear

Clear several items.

50.2.1 clear arp-table-switch

Clear the agent's ARP table (cache).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear arp-table-switch

50.3 show

Display device options and settings.

50.3.1 show network parms

Display the network settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network parms

50.3.2 show network services

Display the opened UDP and TCP ports.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show network services

50.3.3 show network dhcp

Display the additional settings for the DHCP/BOOTP client

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show network dhcp

50.4 show

Display device options and settings.

50.4.1 show arp

Display the ARP table.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show arp

51 Internet Protocol Version 6 (IPv6)

51.1 network

Configure the inband and outband connectivity.

51.1.1 network ipv6 gateway

Set network address of gateway

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 gateway <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

51.1.2 network ipv6 operation

Enable or disable the IPv6 feature.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: network ipv6 operation
- no network ipv6 operation
Disable the option
- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no network ipv6 operation

51.1.3 network ipv6 address delete

Delete a static IPv6 address.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 address delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0..128	Prefix

51.1.4 network ipv6 address enable

Enable a static IPv6 address.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 address enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0..128	Prefix

51.1.5 network ipv6 address disable

Disable a static IPv6 address.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 address disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0..128	Prefix

51.1.6 network ipv6 address modify

Modify an IPv6 address

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: network ipv6 address modify <P-1> <P-2> eui-64 <P-3>
- eui-64: Change the EUI option.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0..128	Prefix
P-3	enable	Enable the option.
	disable	Disable the option.

51.1.7 network ipv6 address add

Add a new static IPv6 address.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 address add <P-1> <P-2> [<P-3>]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0..128	Prefix
P-3	eui-64	Extended unique identifier

51.1.8 network ipv6 protocol

Set protocol for IPv6 configuration: none, DHCP, SLAAC or both.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 protocol <P-1>

Parameter	Value	Meaning
P-1	none	Disable IPv6 Protocol
	autoconf	Enable SLAAC Protocol.
	dhcpv6	Enable DHCPv6 Protocol.
	all	Enable all IPv6 dynamic protocols.

51.1.9 network ipv6 dad-transmits

Set the number of Neighbor Solicitation packets to be sent for Duplicate Address Detection.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network ipv6 dad-transmits <P-1>

Parameter	Value	Meaning
P-1	0..5	Range of number of NS packets for DAD

51.2 show

Display device options and settings.

51.2.1 show network ipv6 neighbors

Show the table of neighbors.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network ipv6 neighbors

51.2.2 show network ipv6 address all

All IPv6 addresses.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network ipv6 address all

51.2.3 show network ipv6 address autoconf

IPv6 addresses obtained from SLAAC.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network ipv6 address autoconf

51.2.4 show network ipv6 address dhcpv6

IPv6 addresses obtained from DHCPv6.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network ipv6 address dhcpv6

51.2.5 show network ipv6 global

Display the global IPv6 information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network ipv6 global

52 ICMP Router Discovery Protocol (IRDP)

52.1 ip

IP interface commands.

52.1.1 ip irdp operation

This command enables/disables Router Discovery on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp operation

■ no ip irdp operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip irdp operation

52.1.2 ip irdp address

Configure the address to be used to advertise the router. The valid options are 224.0.0.1 and 255.255.255.255.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp address <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

52.1.3 ip irdp holdtime

Configure the value of holdtime of the router advertisement (Range: maxadvertinterval-9000).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp holdtime <P-1>

Parameter	Value	Meaning
P-1	4..9000	Enter a number in the given range.

52.1.4 ip irdp maxadvertinterval

Configure the maxtime between sending router advertisement.(Range: minadvertinterval-holdtime).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp maxadvertinterval <P-1>

Parameter	Value	Meaning
P-1	4..1800	Enter a number in the given range.

52.1.5 ip irdp minadvertinterval

Configure the mintime between sending router advertisement. The value must be less than or equal to maxadvertinterval.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp minadvertinterval <P-1>

Parameter	Value	Meaning
P-1	3..1800	Enter a number in the given range.

52.1.6 ip irdp preference

Configure the preferability of address as default router address.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip irdp preference <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	Enter a number in the given range.

52.2 show

Display device options and settings.

52.2.1 show ip irdp

Display the Router Discovery information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show ip irdp [<P-1>]`

Parameter	Value	Meaning
P-1	slot no./port no.	

53 Inter Range Instrumentation Group IRIG-B

53.1 irig-b

Set IRIG-B parameters

53.1.1 irig-b operation

Enable or disable the IRIG-B output.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: irig-b operation
- no irig-b operation
- Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no irig-b operation

53.1.2 irig-b mode

Set IRIG-B mode

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: irig-b mode <P-1>

Parameter	Value	Meaning
P-1	b000	Mode IRIG-B000 (BCDtoy, CF, SBS)
	b001	Mode IRIG-B001 (BCDtoy, CF)
	b002	Mode IRIG-B002 (BCDtoy)
	b003	Mode IRIG-B003 (BCDtoy, SBS)
	b004	Mode IRIG-B004 (BCDtoy, BCDyear, CF, SBS)
	b005	Mode IRIG-B005 (BCDtoy, BCDyear, CF)
	b006	Mode IRIG-B006 (BCDtoy, BCDyear)
	b007	Mode IRIG-B007 (BCDtoy, BCDyear, SBS)

53.1.3 irig-b pps

Set IRIG-B pps output parameters

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: irig-b pps
- no irig-b pps
- Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no irig-b pps

53.1.4 irig-b time

Set IRIG-B time mode

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: irig-b time <P-1>

Parameter	Value	Meaning
P-1	utc	Transmit UTC.
	local	Transmit local time.

53.2 show

Display device options and settings.

53.2.1 show irig-b

Display the IRIG-B settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show irig-b

54 Ring Coupling

54.1 ring-coupling

Configure the ring/net coupling settings.

54.1.1 ring-coupling add

Create a new Ring/Network coupling configuration. The configuration consists of default parameters and the operation is disabled. The interface specified as parameter represents the coupling port.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ring-coupling add <P-1> [mode <P-2>] [net-coupling <P-3>] [redundancy-mode <P-4>] [control-port <P-5>] [partner-port <P-6>]

[mode]: Configure operating mode.

[net-coupling]: Configure the Ring/Network coupling mode as either network or ring-only.

[redundancy-mode]: Configure the redundancy mode as either extended or normal.

[control-port]: Configure the control port (<slot/port>). The control port is only used for outband configurations.

[partner-port]: Configure the partner coupling port(<slot/port>). The partner coupling port is only used for the single configuration mode.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	single	Configure the operating mode of the ring coupling to single. Both of the coupling ports are local to the switch, switch performs master and slave functions.
	dual-master-inband	Configure the operating mode of the ring coupling to dual-master-inband. The second coupling port is on a remote switch, local switch is master, communication over network.
	dual-master-outband	Configure the operating mode of the ring coupling to dual-master-outband. The second coupling port is on a remote switch, local switch is master, communication over dedicated control port.
	dual-slave-inband	Configure the operating mode of the ring coupling to dual-slave-inband. The second coupling port is on a remote switch, local switch is slave, communication over network.
	dual-slave-outband	Configure the operating mode of the ring coupling to dual-slave-outband. The second coupling port is on a remote switch, local switch is slave, communication over dedicated control port.
P-3	ring-only	Select the ring coupling mode for a ring network. Both of the network segments that are coupled are HIPER rings.
	network	Select the ring coupling mode for a bus or mesh network. The network segment adjacent to the switches that handle the ring coupling is not a HIPER ring.
P-4	normal	Select the ring coupling mode for normal redundancy mode. The slave does not respond to a potential failure in the remote ring or network.
	extended	Select the ring coupling mode for extended redundancy mode. The slave responds to a potential failure in the remote ring or network.
P-5	slot no./port no.	
P-6	slot no./port no.	

54.1.2 ring-coupling delete

Delete the Ring/Network coupling configuration with the coupling-port index.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ring-coupling delete <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

54.1.3 ring-coupling modify

Modify the Ring/Network coupling configuration with the coupling-port index.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ring-coupling modify <P-1> mode <P-2> control-port <P-3> partner-port <P-4> net-coupling <P-5> redundancy-mode <P-6>

mode: Modify the operating mode.

control-port: Modify the control port (<slot/port>). The control port is only used for outband configurations.

partner-port: Modify the partner coupling port(<slot/port>). The partner coupling port is only used for single configuration.

net-coupling: Configure the Ring/Network coupling mode as either network or ring-only.

redundancy-mode: Configure the redundancy mode as either extended or normal.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	single	Configure the operating mode of the ring coupling to single. Both of the coupling ports are local to the switch, switch performs master and slave functions.
	dual-master-inband	Configure the operating mode of the ring coupling to dual-master-inband. The second coupling port is on a remote switch, local switch is master, communication over network.
	dual-master-outband	Configure the operating mode of the ring coupling to dual-master-outband. The second coupling port is on a remote switch, local switch is master, communication over dedicated control port.
	dual-slave-inband	Configure the operating mode of the ring coupling to dual-slave-inband. The second coupling port is on a remote switch, local switch is slave, communication over network.
	dual-slave-outband	Configure the operating mode of the ring coupling to dual-slave-outband. The second coupling port is on a remote switch, local switch is slave, communication over dedicated control port.
P-3	slot no./port no.	
P-4	slot no./port no.	
P-5	ring-only	Select the ring coupling mode for a ring network. Both of the network segments that are coupled are HIPER rings.
	network	Select the ring coupling mode for a bus or mesh network. The network segment adjacent to the switches that handle the ring coupling is not a HIPER ring.
P-6	normal	Select the ring coupling mode for normal redundancy mode. The slave does not respond to a potential failure in the remote ring or network.
	extended	Select the ring coupling mode for extended redundancy mode. The slave responds to a potential failure in the remote ring or network.

54.1.4 ring-coupling enable

Enable the Ring/Network coupling configuration with the coupling-port index.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ring-coupling enable <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

54.1.5 ring-coupling disable

Disable the Ring/Network coupling configuration with the coupling-port index.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ring-coupling disable <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

54.2 show

Display device options and settings.

54.2.1 show ring-coupling global

Display the ring coupling settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ring-coupling global

54.2.2 show ring-coupling status

Display the ring coupling states.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ring-coupling status

55 License Manager

55.1 license

Configure licensing settings.

55.1.1 license level

Sets the software level of the device. The change needs a config save and a reboot to take effect.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: license level <P-1>

Parameter	Value	Meaning
P-1	default	Default software level of the device
	2S	Software Layer 2 Standard
	2A	Software Layer 2 Advanced
	3S	Software Layer 3 Standard

55.1.2 license package

Enable or disable a license package

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: license package <P-1>

Parameter	Value	Meaning
P-1	UR	Unicast Routing
	MR	Multicast Routing (includes Unicast Routing)

- no license package
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no license package <P-1>

55.2 show

Display device options and settings.

55.2.1 show license global

Display the global information about the license of device software.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show license global

55.2.2 show license package

Display the license packages of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show license package [<P-1>]

Parameter	Value	Meaning
P-1	0..4294967294	Enter a number in the given range.

56 Link Backup

56.1 link-backup

Configure Link Backup parameters.

56.1.1 link-backup operation

Enable or disable Link Backup.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: link-backup operation
-
- no link-backup operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no link-backup operation

56.2 link-backup

Configure Link Backup parameters.

56.2.1 link-backup add

Add a Link Backup interface pair.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: link-backup add <P-1> [failback-time <P-2>] [description <P-3>]
[failback-time]: FailBack time in seconds for the interface pair.
[description]: Description for the interface pair.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	0..3600	FailBack time interval.(default: 30)
P-3	string	Enter a user-defined text, max. 256 characters.

56.2.2 link-backup delete

Delete the associated backup interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: link-backup delete <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

56.2.3 link-backup modify

Modify a Link Backup interface pair.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: link-backup modify <P-1> [failback-status <P-2>] [failback-time <P-3>]
[description <P-4>] [status <P-5>]
[failback-status]: Modify failback status.(default: enabled)
[failback-time]: Modify failback time.(default: 30)
[description]: Description for the interface pair.
[status]: Enable or disable a Link Backup interface pair entry.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	enable	Enable the option.
	disable	Disable the option.
P-3	0..3600	FailBack time interval.(default: 30)
P-4	string	Enter a user-defined text, max. 256 characters.

Parameter	Value	Meaning
P-5	enable	Enable the option.
	disable	Disable the option.

56.3 show

Display device options and settings.

56.3.1 show link-backup operation

Display the Link Backup global information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show link-backup operation

56.3.2 show link-backup pairs

Display the Link Backup interface pairs.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show link-backup pairs [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	slot no./port no.	

57 Link Layer Discovery Protocol (LLDP)

57.1 lldp

Configure of Link Layer Discovery Protocol.

57.1.1 lldp operation

Enable or disable the LLDP operational state.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp operation

■ no lldp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp operation

57.1.2 lldp config chassis admin-state

Enable or disable the LLDP operational state.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis admin-state <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

57.1.3 lldp config chassis notification-interval

Enter the LLDP notification interval in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis notification-interval <P-1>

Parameter	Value	Meaning
P-1	5..3600	Enter a number in the given range.

57.1.4 lldp config chassis re-init-delay

Enter the LLDP re-initialization delay in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis re-init-delay <P-1>

Parameter	Value	Meaning
P-1	1..10	Enter a number in the given range.

57.1.5 lldp config chassis tx-delay

Enter the LLDP transmit delay in seconds (tx-delay smaller than (0.25 × tx-interval))

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis tx-delay <P-1>

Parameter	Value	Meaning
P-1	1..8192	Enter a number in the given range (tx-delay smaller than (0.25 × tx-interval))

57.1.6 lldp config chassis tx-hold-multiplier

Enter the LLDP transmit hold multiplier.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis tx-hold-multiplier <P-1>

Parameter	Value	Meaning
P-1	2..10	Enter a number in the given range.

57.1.7 lldp config chassis tx-interval

Enter the LLDP transmit interval in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp config chassis tx-interval <P-1>

Parameter	Value	Meaning
P-1	5..32768	Enter a number in the given range.

57.2 show

Display device options and settings.

57.2.1 show lldp global

Display the LLDP global configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp global

57.2.2 show lldp port

Display the port specific LLDP configurations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

57.2.3 show lldp remote-data

Remote information collected with LLDP.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp remote-data [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

57.3 lldp

Configure of Link Layer Discovery Protocol on a port.

57.3.1 lldp admin-state

Configure how the interface processes LLDP frames.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp admin-state <P-1>

Parameter	Value	Meaning
P-1	tx-only	Interface will only transmit LLDP frames. Received frames are not processed.
	rx-only	Interface will only receive LLDP frames. Frames are not transmitted.
	tx-and-rx	Interface will transmit and receive LLDP frames. This is the default setting.
	disable	Interface will neither transmit nor process received LLDP frames.

57.3.2 lldp fdb-mode

Configure the LLDP FDB mode for this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp fdb-mode <P-1>

Parameter	Value	Meaning
P-1	lldp-only	Collected remote data will be based on received LLDP frames only.
	mac-only	Collected remote data will be based on the switch's FDB entries only.
	both	Collected remote data will be based on received LLDP frames as well as on the switch's FDB entries.
	auto-detect	As long as no LLDP frames are received, the collected remote data will be based on the switch's FDB entries only. After the first LLDP frame is received, the remote data will be based on received LLDP frames only. This is the default setting.

57.3.3 lldp max-neighbors

Enter the LLDP max neighbors for interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp max-neighbors <P-1>

Parameter	Value	Meaning
P-1	1..50	Enter a number in the given range.

57.3.4 lldp notification

Enable or disable the LLDP notification operation for interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: lldp notification
- no lldp notification
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp notification

57.3.5 lldp tlv inline-power

Enable or disable inline-power TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv inline-power <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no lldp tlv inline-power
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv inline-power <P-1>

57.3.6 lldp tlv link-aggregation

Enable or disable link-aggregation TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv link-aggregation <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no lldp tlv link-aggregation
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv link-aggregation <P-1>

57.3.7 lldp tlv mac-phy-config-state

Enable or disable mac-phy-config-state TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv mac-phy-config-state <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no lldp tlv mac-phy-config-state
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv mac-phy-config-state <P-1>

57.3.8 lldp tlv max-frame-size

Enable or disable max-frame-size TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv max-frame-size <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no lldp tlv max-frame-size
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv max-frame-size <P-1>

57.3.9 lldp tlv mgmt-addr

Enable or disable mgmt-addr TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv mgmt-addr

- no lldp tlv mgmt-addr
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv mgmt-addr

57.3.10 lldp tlv port-desc

Enable or disable port description TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv port-desc <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

- no lldp tlv port-desc
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv port-desc <P-1>

57.3.11 lldp tlv port-vlan

Enable or disable port-vlan TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv port-vlan

- no lldp tlv port-vlan
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv port-vlan

57.3.12 lldp tlv protocol

Enable or disable protocol TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv protocol

■ no lldp tlv protocol

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp tlv protocol

57.3.13 lldp tlv sys-cap

Enable or disable system capabilities TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv sys-cap <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

■ no lldp tlv sys-cap

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp tlv sys-cap <P-1>

57.3.14 lldp tlv sys-desc

Enable or disable system description TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv sys-desc <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

■ no lldp tlv sys-desc

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp tlv sys-desc <P-1>

57.3.15 lldp tlv sys-name

Enable or disable system name TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv sys-name <P-1>

Parameter	Value	Meaning
P-1	[cr]	Enable the Bit.

■ no lldp tlv sys-name

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp tlv sys-name <P-1>

57.3.16 lldp tlv vlan-name

Enable or disable vlan name TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv vlan-name

- no lldp tlv vlan-name
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv vlan-name

57.3.17 lldp tlv protocol-based-vlan

Enable or disable protocol-based vlan TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv protocol-based-vlan

- no lldp tlv protocol-based-vlan
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv protocol-based-vlan

57.3.18 lldp tlv igmp

Enable or disable igmp TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv igmp

- no lldp tlv igmp
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv igmp

57.3.19 lldp tlv portsec

Enable or disable portsec TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv portsec

- no lldp tlv portsec
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv portsec

57.3.20 lldp tlv ptp

Enable or disable PTP TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv ptp

- no lldp tlv ptp
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv ptp

57.3.21 lldp tlv pnio

Enable or disable PROFINET TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv pnio

- no lldp tlv pnio
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv pnio

57.3.22 lldp tlv pnio-alias

Enable or disable PROFINET alias TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv pnio-alias

- no lldp tlv pnio-alias
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv pnio-alias

57.3.23 lldp tlv pnio-mrp

Enable or disable PROFINET MRP TLV transmission.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp tlv pnio-mrp

- no lldp tlv pnio-mrp
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no lldp tlv pnio-mrp

58 Media Endpoint Discovery LLDP-MED

58.1 Ildp

Configure of Link Layer Discovery Protocol on a port.

58.1.1 Ildp med confignotification

Enable or disable LLDP-MED notification send for this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp med confignotification

■ no Ildp med confignotification

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp med confignotification

58.1.2 Ildp med transmit-tlv capabilities

Include/Exclude LLDP MED capabilities TLV.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp med transmit-tlv capabilities

■ no Ildp med transmit-tlv capabilities

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp med transmit-tlv capabilities

58.1.3 Ildp med transmit-tlv network-policy

Include/Exclude LLDP network policy TLV.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp med transmit-tlv network-policy

■ no Ildp med transmit-tlv network-policy

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no lldp med transmit-tlv network-policy

58.2 Ildp

Configure of Link Layer Discovery Protocol.

58.2.1 Ildp med faststartrepeatcount

Configure LLDP-MED fast start repeat count.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: lldp med faststartrepeatcount <P-1>

Parameter	Value	Meaning
P-1	1..10	Enter a value representing the number of LLDP PDUs that will be transmitted.Default is 3.

58.3 show

Display device options and settings.

58.3.1 show lldp med global

Display a summary of the current LLDP-MED configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp med global

58.3.2 show lldp med interface

Display the current LLDP-MED configuration on a specific port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp med interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

58.3.3 show lldp med local-device

Display detailed information about the LLDP-MED data

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp med local-device <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

58.3.4 show lldp med remote-device detail

Display the LLDP-MED detail configuration for a remote device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp med remote-device detail <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

58.3.5 show lldp med remote-device summary

Display the LLDP-MED summary configuration for a remote device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show lldp med remote-device summary [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

59 Logging

59.1 logging

Logging configuration.

59.1.1 logging audit-trail

Add a comment for the audit trail.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging audit-trail <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 80 characters.

59.1.2 logging buffered severity

Configure the minimum severity level to be logged to the high priority buffer.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging buffered severity <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.3 logging host add

Add a new logging host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging host add <P-1> addr <P-2> [transport <P-3>] [port <P-4>] [severity <P-5>] [type <P-6>]

addr: Enter the IP address of the server.

[transport]: Configure the type of transport used for syslog server transmission.

[port]: Enter the port used for syslog server transmission.

[severity]: Configure the minimum severity level to be sent to this syslog server.

[type]: Configure the type of log messages to be sent to the syslog server.

Parameter	Value	Meaning
P-1	1..8	Syslog server entry index
P-2	A.B.C.D	IP address.
P-3	udp	The UDP-based transmission.
	tls	The TLS-based transmission.
P-4	1..65535	Port number to be used

Parameter	Value	Meaning
P-5	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
P-6	systemlog	the system event log entries
	audittrail	the audit trail log entries

59.1.4 logging host delete

Delete a logging host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging host delete <P-1>

Parameter	Value	Meaning
P-1	1..8	Syslog server entry index

59.1.5 logging host enable

Enable a logging host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging host enable <P-1>

Parameter	Value	Meaning
P-1	1..8	Syslog server entry index

59.1.6 logging host disable

Disable a logging host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging host disable <P-1>

Parameter	Value	Meaning
P-1	1..8	Syslog server entry index

59.1.7 logging host modify

Modify an existing logging host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging host modify <P-1> [addr <P-2>] [transport <P-3>] [port <P-4>] [severity <P-5>] [type <P-6>]

[addr]: Enter the IP address of the server.

[transport]: Configure the type of transport used for syslog server transmission.

[port]: Enter the port used for syslog server transmission.

[severity]: Configure the minimum severity level to be sent to this syslog server.

[type]: Configure the type of log messages to be sent to the syslog server.

Parameter	Value	Meaning
P-1	1..8	Syslog server entry index
P-2	A.B.C.D	IP address.
P-3	udp	The UDP-based transmission.
	tls	The TLS-based transmission.
P-4	1..65535	Port number to be used

Parameter	Value	Meaning
P-5	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
P-6	systemlog	the system event log entries
	audittrail	the audit trail log entries

59.1.8 logging syslog operation

Enable or disable the syslog client.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging syslog operation

■ no logging syslog operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no logging syslog operation

59.1.9 logging current-console operation

Enable or disable logging messages to the current remote console.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging current-console operation

■ no logging current-console operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no logging current-console operation

59.1.10 logging current-console severity

Configure the minimum severity level to be sent to the current remote console.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging current-console severity <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.11 logging console operation

Enable or disable logging to the local V.24 console.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging console operation

■ no logging console operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no logging console operation

59.1.12 logging console severity

Configure the minimum severity level to be logged to the V.24 console.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging console severity <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.13 logging persistent operation

Enable or disable persistent logging. This feature is only available when an ENVN is connected to the device. The logging information is saved on the selected ENVN.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging persistent operation

- no logging persistent operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no logging persistent operation

59.1.14 logging persistent numfiles

Enter the maximum number of log files.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging persistent numfiles <P-1>

Parameter	Value	Meaning
P-1	0..25	number of logfiles

59.1.15 logging persistent filesize

Enter the maximum size of a log file.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging persistent filesize <P-1>

Parameter	Value	Meaning
P-1	0..4096	Maximum persistent logfile size on the non-volatile memory in kBytes

59.1.16 logging persistent severity-level

Configure the minimum severity level to be logged into files.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging persistent severity-level <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.17 logging email operation

Enable or disable logging email-alert globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email operation

- no logging email operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no logging email operation

59.1.18 logging email from-addr

Configure mail address used by device to send email-alert.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email from-addr <P-1>

Parameter	Value	Meaning
P-1	string	Enter a valid email address

59.1.19 logging email duration

Periodic timer (in minutes) to send an non-critical logs in mail.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email duration <P-1>

Parameter	Value	Meaning
P-1	30..1440	Time duration in minutes

59.1.20 logging email severity urgent

Urgent severity level

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email severity urgent <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.21 logging email severity non-urgent

Non-urgent severity level

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email severity non-urgent <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

59.1.22 logging email to-addr add

Create a destination address entry with default values

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email to-addr add <P-1> [addr <P-2>] [msgtype <P-3>]

[addr]: Create an entry with specified address

[msgtype]: Create an entry with specified message type

Parameter	Value	Meaning
P-1	1..10	Destination address entry index
P-2	string	Enter a valid email address
P-3	urgent	Urgent message type
	non-urgent	Non-urgent message type

59.1.23 logging email to-addr delete

Delete a destination address

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email to-addr delete <P-1>

Parameter	Value	Meaning
P-1	1..10	Destination address entry index

59.1.24 logging email to-addr modify

Modify a destination address

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email to-addr modify <P-1> [addr <P-2>] [msgtype <P-3>]

[addr]: Modify the destination address

[msgtype]: Modify the message type

Parameter	Value	Meaning
P-1	1..10	Destination address entry index
P-2	string	Enter a valid email address
P-3	urgent	Urgent message type
	non-urgent	Non-urgent message type

59.1.25 logging email to-addr enable

Activate a destination address

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email to-addr enable <P-1>

Parameter	Value	Meaning
P-1	1..10	Destination address entry index

59.1.26 logging email to-addr disable

Deactivate a destination address

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email to-addr disable <P-1>

Parameter	Value	Meaning
P-1	1..10	Destination address entry index

59.1.27 logging email mail-server add

Add a server entry to SMTP address table

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging email mail-server add <P-1> [addr <P-2>] [security <P-3>] [username <P-4>] [password <P-5>] [port <P-6>] [timeout <P-7>] [description <P-8>]

[addr]: SMTP server address

[security]: Security mode used in SMTP server.

[username]: Login ID to access SMTP server.

[password]: Password to access SMTP server.

[port]: SMTP server port number.

[timeout]: SMTP server connection timeout

[description]: SMTP server description

Parameter	Value	Meaning
P-1	1..5	SMTP server index
P-2	A.B.C.D	IP address.

Parameter	Value	Meaning
P-3	none	Security mode none
	tlsv1	Security mode TLSv1
P-4	string	Enter a user-defined text, max. 32 characters.
P-5	string	Enter a user-defined text, max. 32 characters.
P-6	1..65535	Port number to be used
P-7	1..15	SMTP server timeout range
P-8	string	Enter a user-defined text, max. 1024 characters (allowed characters are from ASCII 32 to 127).

59.1.28 logging email mail-server delete

Delete a server entry from SMTP address table

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email mail-server delete <P-1>

Parameter	Value	Meaning
P-1	1..5	SMTP server index

59.1.29 logging email mail-server modify

Modify an SMTP server entry

- Mode: Global Config Mode
 - Privilege Level: Administrator
 - Format: logging email mail-server modify <P-1> [addr <P-2>] [security <P-3>] [username <P-4>] [password <P-5>] [port <P-6>] [timeout <P-7>] [description <P-8>]
- [addr]: SMTP server address
[security]: Security mode used in SMTP server.
[username]: Login ID to access SMTP server.
[password]: Password to access SMTP server.
[port]: SMTP server port number.
[timeout]: SMTP Timeout
[description]: SMTP server description

Parameter	Value	Meaning
P-1	1..5	SMTP server index
P-2	A.B.C.D	IP address.
P-3	none	Security mode none
	tlsv1	Security mode TLSv1
P-4	string	Enter a user-defined text, max. 32 characters.
P-5	string	Enter a user-defined text, max. 32 characters.
P-6	1..65535	Port number to be used
P-7	1..15	SMTP server timeout range
P-8	string	Enter a user-defined text, max. 1024 characters (allowed characters are from ASCII 32 to 127).

59.1.30 logging email subject add

Create an email subject entry

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email subject add <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	urgent	Urgent message type
	non-urgent	Non-urgent message type
P-2	string	<string> Enter the email subject (Within double quotations if subject includes space)

59.1.31 logging email subject delete

Delete an email subject entry

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email subject delete <P-1>

Parameter	Value	Meaning
P-1	urgent	Urgent message type
	non-urgent	Non-urgent message type

59.1.32 logging email subject modify

Modify an email subject entry

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email subject modify <P-1> <P-2>

Parameter	Value	Meaning
P-1	urgent	Urgent message type
	non-urgent	Non-urgent message type
P-2	string	<string> Enter the email subject (Within double quotations if subject includes space)

59.1.33 logging email test msgtype

Configure the message type for test mail.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging email test msgtype <P-1> <P-2>

Parameter	Value	Meaning
P-1	urgent	Urgent message type
	non-urgent	Non-urgent message type
P-2	string	Enter a user-defined text, max. 255 characters.

59.2 show

Display device options and settings.

59.2.1 show logging buffered

Display the buffered (in-memory) log entries.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging buffered [<P-1>]

Parameter	Value	Meaning
P-1	string	<filter> Enter a comma separated list of severity ranges, numbers or enum strings are allowed. Example: 0-1,informational-debug

59.2.2 show logging traplogs

Display the trap log entries.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging traplogs

59.2.3 show logging console

Display the console logging configurations.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging console

59.2.4 show logging persistent

Display the persistent logging configurations.

- Mode: Command is in all modes available.
 - Privilege Level: Guest
 - Format: show logging persistent [logfiles]
- [logfiles]: List the persistent log files.

59.2.5 show logging syslog

Display the current syslog operational setting.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging syslog

59.2.6 show logging host

Display a list of logging hosts currently configured.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging host

59.2.7 show logging email statistics

Display the statistics of email logging.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging email statistics

59.2.8 show logging email global

Display the global settings of email logging feature.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging email global

59.2.9 show logging email to-addr

Display a list of destination addresses configured.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging email to-addr [<P-1>]

Parameter	Value	Meaning
P-1	1..10	Destination address entry index

59.2.10 show logging email subject

Display the subject entries configured.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging email subject [<P-1>]

Parameter	Value	Meaning
P-1	urgent	Urgent message type
	non-urgent	Non-urgent message type

59.2.11 show logging email mail-server

Display the SMTP server settings.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show logging email mail-server [<P-1>]

Parameter	Value	Meaning
P-1	1..5	SMTP server index

59.3 copy

Copy different kinds of items.

59.3.1 copy eventlog buffered envm

Copy a buffered log from the device to external non-volatile memory.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: copy eventlog buffered envm <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

59.3.2 copy eventlog buffered remote

Copy a buffered log from the device to a file server.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: copy eventlog buffered remote <P-1> [source-interface <P-2>]

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

59.3.3 copy eventlog persistent

Copy the persistent logs from the device to an envm or a file server.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy eventlog persistent <P-1> envm <P-2> remote <P-3> [source-interface <P-4>]

envm: Copy the persistent log from the device to external non-volatile memory.

remote: Copy the persistent logs from the device to a file server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.
P-2	string	Enter a user-defined text, max. 32 characters.
P-3	string	Enter a user-defined text, max. 128 characters.
P-4	slot no./port no.	

59.3.4 copy traplog system envm

Copy the traplog from the device to external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy traplog system envm <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

59.3.5 copy traplog system remote

Copy the traplog from the device to a file server

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: copy traplog system remote <P-1> [source-interface <P-2>]

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

59.3.6 copy audittrail system envm

Copy the audit trail from the device to external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator, Auditor
- ▶ Format: copy audittrail system envm <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

59.3.7 copy audittrail system remote

Copy the audit trail from the device to a file server.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator, Auditor
- ▶ Format: copy audittrail system remote <P-1> [source-interface <P-2>]

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

59.3.8 copy mailcacert remote

Copy CA certificate file (*.pem) from the remote AD server to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy mailcacert remote <P-1> nvm [<P-2>] [source-interface <P-3>]

nvm: Copy CA certificate file (*.pem) from the remote AD server to the device.

[source-interface]: Specify the source-interface to be used (physical or logical).

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.
P-3	slot no./port no.	

59.3.9 copy mailcacert envm

Copy CA certificate file (*.pem) from external non-volatile memory to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy mailcacert envm <P-1> nvm [<P-2>]

nvm: Copy CA certificate file (*.pem) from external non-volatile memory to the device.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.

59.3.10 copy syslogcacert remote

Copy CA certificate file (*.pem) from the remote AD server to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy syslogcacert remote <P-1> nvm [<P-2>] [source-interface <P-3>]

nvm: Copy CA certificate file (*.pem) from the remote AD server to the device.

[source-interface]: Specify the source-interface to be used (physical or logical).

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.
P-3	slot no./port no.	

59.3.11 copy syslogcacert envm

Copy CA certificate file (*.pem) from external non-volatile memory to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy syslogcacert envm <P-1> nvm [<P-2>]

nvm: Copy CA certificate file (*.pem) from external non-volatile memory to the device.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.

59.4 clear

Clear several items.

59.4.1 clear logging buffered

Clear buffered log from memory.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: clear logging buffered

59.4.2 clear logging persistent

Clear persistent log from memory.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: clear logging persistent

59.4.3 clear logging email statistics

Clear email statistics

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear logging email statistics

59.4.4 clear eventlog

Clear the event log entries from memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear eventlog

60 Loop Protection

60.1 loop-protection

Configure loop protection settings.

60.1.1 loop-protection operation

Enable or disable loop protection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection operation

- no loop-protection operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no loop-protection operation

60.1.2 loop-protection tx-interval

Transmit interval for detection PDUs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection tx-interval <P-1>

Parameter	Value	Meaning
P-1	1..10	PDU transmit interval (in seconds).

60.1.3 loop-protection rx-threshold

Amount of detection PDUs to be received until an action is performed.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection rx-threshold <P-1>

Parameter	Value	Meaning
P-1	1..50	PDU receive threshold (in frames).

60.2 loop-protection

Configure loop protection settings for interfaces.

60.2.1 loop-protection operation

Enable or disable loop protection.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection operation

- no loop-protection operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no loop-protection operation

60.2.2 loop-protection mode

Set loop protection interface operation mode.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection mode <P-1>

Parameter	Value	Meaning
P-1	active	The device will send detection PDUs and process them on reception.
	passive	The device will only process detection PDUs.

60.2.3 loop-protection action

Set loop protection action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection action <P-1>

Parameter	Value	Meaning
P-1	trap	Send a trap.
	auto-disable	Enable control via Auto-Disable.
	all	Send trap and enable control via Auto-Disable.

60.2.4 loop-protection vlan

Specify the loop detection operating VLAN.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection vlan <P-1>

Parameter	Value	Meaning
P-1	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.

60.2.5 loop-protection clear-statistics

Clear loop protection interface statistics.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: loop-protection clear-statistics

60.3 show

Display device options and settings.

60.3.1 show loop-protection global

Loop protection settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show loop-protection global

60.3.2 show loop-protection interface

Display loop protection interface settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show loop-protection interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

61 Parallel Redundancy Protocol (PRP)

61.1 prp

Configure parallel redundancy protocol (PRP) parameters and clear tables and counters.

61.1.1 prp operation

Enable or disable the parallel redundancy protocol (PRP).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: prp operation

■ no prp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no prp operation

61.1.2 prp instance

Configure PRP instances

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: prp instance <P-1> operation port-a port-b supervision evaluate send redbox-exclusively speed <P-2>

operation: Enable or disable the PRP instance.

port-a: Enable or disable the first port of the PRP line.

port-b: Enable or disable the second port of the PRP line.

supervision: Configure the PRP supervision tx and rx packet handling.

evaluate: Enable or disable evaluation of received supervision packets.

send: Enable or disable sending of supervision packets.

redbox-exclusively: Enable sending of supervision packets for this RedBox exclusively. Use the no form of the command to send supervision packets for each connected VDAN and this RedBox (if send is enabled).

speed: Configure the speed of LRE interfaces.

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).
P-2	100	100 MBit/s
	1000	1000 MBit/s

■ no prp instance

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no prp instance <P-1> operation port-a port-b supervision evaluate send redbox-exclusively speed

61.2 show

Display device options and settings.

61.2.1 show prp global

Display the global preferences.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show prp global

61.2.2 show prp instance

Display the PRP instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show prp instance [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.2.3 show prp node-table

Display the node table (received supervision packets).

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show prp node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.2.4 show prp proxy-node-table

Display the proxy node table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show prp proxy-node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.2.5 show prp counters

Display the PRP counters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show prp counters [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.3 clear

Clear several items.

61.3.1 clear prp proxy-node-table

Clear proxy-node-table.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear prp proxy-node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.3.2 clear prp node-table

Clear node-table (received supervision packets).

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear prp node-table [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

61.3.3 clear prp counters

Clear PRP counters.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear prp counters [<P-1>]

Parameter	Value	Meaning
P-1	1..1	Enter PRP instance number (only 1 supported).

62 MAC Notification

62.1 mac

Set MAC parameters.

62.1.1 mac notification operation

Enable or disable MAC notification globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac notification operation

■ no mac notification operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mac notification operation

62.1.2 mac notification interval

Set MAC notification interval in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac notification interval <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	Enter a number in the given range.

62.2 mac

Set MAC parameters.

62.2.1 mac notification operation

Enable or disable MAC notification globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac notification operation

■ no mac notification operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mac notification operation

62.2.2 mac notification interval

Set MAC notification interval in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mac notification interval <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	Enter a number in the given range.

62.3 mac

MAC interface commands.

62.3.1 mac notification operation

Enable or disable MAC notification on this interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: mac notification operation
- no mac notification operation
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mac notification operation

62.4 mac

MAC interface commands.

62.4.1 mac notification operation

Enable or disable MAC notification on this interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: mac notification operation
- no mac notification operation
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mac notification operation

62.5 show

Display device options and settings.

62.5.1 show mac notification global

Display the MAC notification global information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac notification global

62.5.2 show mac notification interface

Display the MAC notification interface information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac notification interface

63 MAC VLAN

63.1 vlan

Creation and configuration of VLANS.

63.1.1 vlan association mac

Configure an association between a MAC address and a VLAN.

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan association mac <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	1..4042	Enter the VLAN ID.

- no vlan association mac
Disable the option
 - ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no vlan association mac <P-1> <P-2>

63.2 show

Display device options and settings.

63.2.1 show vlan association mac

Display the association MAC address and VLAN table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan association mac [<P-1>]

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	Enter a MAC address.
	1..4042	Enter a VLAN ID.

64 Management Access

64.1 network

Configure the inband and outband connectivity.

64.1.1 network management access web timeout

Set the web interface idle timeout.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access web timeout <P-1>

Parameter	Value	Meaning
P-1	0..160	Idle timeout of a session in minutes (default: 5).

64.1.2 network management access add

Add a new entry with index.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access add <P-1> [ip <P-2>] [mask <P-3>] [http <P-4>] [https <P-5>] [snmp <P-6>] [telnet <P-7>] [iec61850-mms <P-8>] [modbus-tcp <P-9>] [ssh <P-10>] [ethernet-ip <P-11>] [profinet-io <P-12>]

[ip]: Configure IP address which should have access to management.

[mask]: Configure network mask to allow a subnet for management access.

[http]: Configure if HTTP is allowed to have management access.

[https]: Configure if HTTPS is allowed to have management access.

[snmp]: Configure if SNMP is allowed to have management access.

[telnet]: Configure if TELNET is allowed to have management access.

[iec61850-mms]: Configure if IEC61850-MMS is allowed to have management access.

[modbus-tcp]: Configure if Modbus TCP/IP is allowed to have management access.

[ssh]: Configure if SSH is allowed to have management access.

[ethernet-ip]: Configure if EtherNet/IP is allowed to have management access.

[profinet-io]: Configure if PROFINET is allowed to have management access.

Parameter	Value	Meaning
P-1	1..16	Pool entry index.
P-2	A.B.C.D	IP address.
P-3	0..32	Prefix length netmask.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	enable	Enable the option.
	disable	Disable the option.
P-6	enable	Enable the option.
	disable	Disable the option.
P-7	enable	Enable the option.
	disable	Disable the option.
P-8	enable	Enable the option.
	disable	Disable the option.
P-9	enable	Enable the option.
	disable	Disable the option.
P-10	enable	Enable the option.
	disable	Disable the option.
P-11	enable	Enable the option.
	disable	Disable the option.
P-12	enable	Enable the option.
	disable	Disable the option.

64.1.3 network management access delete

Delete an entry with index.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access delete <P-1>

Parameter	Value	Meaning
P-1	1..16	Pool entry index.

64.1.4 network management access modify

Modify an entry with index.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access modify <P-1> ip <P-2> mask <P-3> http <P-4> https <P-5> snmp <P-6> telnet <P-7> iec61850-mms <P-8> modbus-tcp <P-9> ssh <P-10> ethernet-ip <P-11> profinet-io <P-12>

ip: Configure ip-address which should have access to management.

mask: Configure network mask to allow a subnet for management access.

http: Configure if HTTP is allowed to have management access.

https: Configure if HTTPS is allowed to have management access.

snmp: Configure if SNMP is allowed to have management access.

telnet: Configure if TELNET is allowed to have management access.

iec61850-mms: Configure if IEC61850-MMS is allowed to have management access.

modbus-tcp: Configure if Modbus TCP/IP is allowed to have management access.

ssh: Configure if SSH is allowed to have management access.

ethernet-ip: Configure if EtherNet/IP is allowed to have management access.

profinet-io: Configure if PROFINET is allowed to have management access.

Parameter	Value	Meaning
P-1	1..16	Pool entry index.
P-2	A.B.C.D	IP address.
P-3	0..32	Prefix length netmask.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	enable	Enable the option.
	disable	Disable the option.
P-6	enable	Enable the option.
	disable	Disable the option.
P-7	enable	Enable the option.
	disable	Disable the option.
P-8	enable	Enable the option.
	disable	Disable the option.
P-9	enable	Enable the option.
	disable	Disable the option.
P-10	enable	Enable the option.
	disable	Disable the option.
P-11	enable	Enable the option.
	disable	Disable the option.
P-12	enable	Enable the option.
	disable	Disable the option.

64.1.5 network management access operation

Enable/Disable operation for RMA.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access operation

■ no network management access operation

Disable the option

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no network management access operation

64.1.6 network management access status

Activate/Deactivate an entry.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: network management access status <P-1>

Parameter	Value	Meaning
P-1	1..16	Pool entry index.

- no network management access status
Disable the option
 - ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no network management access status <P-1>

64.2 show

Display device options and settings.

64.2.1 show network management access global

Display the global restricted management access preferences.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network management access global

64.2.2 show network management access rules

Display the restricted management access rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network management access rules [<P-1>]

Parameter	Value	Meaning
P-1	1..16	Pool entry index.

64.2.3 show network management access counters

Display the management access counters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show network management access counters

64.3 clear

Clear several items.

64.3.1 clear management-counters

Clear management access counters.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear management-counters

65 Management Address

65.1 network

Configure the inband and outband connectivity.

65.1.1 network management mac

Configure the locally administered MAC address.

► Mode: Privileged Exec Mode

► Privilege Level: Operator

► Format: network management mac [local-address <P-1>]

[local-address]: Enter the local admin MAC address (xx:xx:xx:xx:xx:xx). If the local address is nonzero, the device starts with this MAC address at the next boot. If the MAC address is changed, they must be stored by the configuration manager. A MAC address with a set multicast bit will not be accepted

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.

65.1.2 network management port

Configure management access per port. Setting to 'all' will allowed access from all ports.

► Mode: Privileged Exec Mode

► Privilege Level: Operator

► Format: network management port <P-1>

Parameter	Value	Meaning
P-1	all or slot no./port no.	

65.2 show

Display device options and settings.

65.2.1 show network management mac

Display the MAC address settings.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show network management mac

65.2.2 show network management port

Display the management access port.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show network management port

66 Modbus

66.1 modbus-tcp

Configure Modbus TCP/IP server settings.

66.1.1 modbus-tcp operation

Enable or disable the Modbus TCP/IP server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: modbus-tcp operation
- no modbus-tcp operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no modbus-tcp operation

66.1.2 modbus-tcp write-access

Enable or disable the write-access on Modbus TCP/IP registers. - Possible security risk, as Modbus TCP/IP communication is not authenticated - .

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: modbus-tcp write-access
- no modbus-tcp write-access
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no modbus-tcp write-access

66.1.3 modbus-tcp port

Defines the port number of the Modbus TCP/IP server (default: 502).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: modbus-tcp port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Enter port number between 1 and 65535

66.1.4 modbus-tcp max-sessions

Defines the maximum number of concurrent Modbus TCP/IP sessions (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: modbus-tcp max-sessions <P-1>

Parameter	Value	Meaning
P-1	1..5	Maximum number of concurrent Modbus TCP/IP server sessions (default: 5).

66.2 show

Display device options and settings.

66.2.1 show modbus-tcp

Display the Modbus TCP/IP server settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show modbus-tcp

67 Multicast Routing

67.1 ip

Set IP parameters.

67.1.1 ip mcast staticroute add

Add a new multicast static route instance.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip mcast staticroute add <P-1> <P-2> rpf-address <P-3>

rpf-address: Set the RPF address.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	
P-3	A.B.C.D	IP address.

67.1.2 ip mcast staticroute modify

Modify parameters of a multicast static route instance.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip mcast staticroute modify <P-1> <P-2> [operation <P-3>] [rpf-address <P-4>] [preference <P-5>]

[operation]: Enable or disable a multicast static route instance.

[rpf-address]: The RPF address.

[preference]: The preference of the static multicast route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	
P-3	enable	Enable the option.
	disable	Disable the option.
P-4	A.B.C.D	IP address.
P-5	1..255	Enter a number in the given range.

67.1.3 ip mcast staticroute delete

Delete a multicast static route instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip mcast staticroute delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

67.1.4 ip mcast operation

Enable or disable IP multicast routing on the router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip mcast operation

■ no ip mcast operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip mcast operation

67.1.5 ip mcast software-dscp-value

Configures the DSCP value that is written into multicast packets that are routed in software.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip mcast software-dscp-value <P-1>

Parameter	Value	Meaning
P-1	0..64	Enter a number in the given range.

67.2 ip

IP interface commands.

67.2.1 ip mcast ttl-threshold

This command sets the datagram TTL threshold for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip mcast ttl-threshold <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

67.2.2 ip mcast boundary

Configure an administratively scoped IP multicast boundary (Range: 239.0.0.0-239.255.255.255).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip mcast boundary <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

- no ip mcast boundary
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip mcast boundary <P-1> <P-2>

67.3 show

Display device options and settings.

67.3.1 show ip mcast global

Display the general IP multicast information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast global

67.3.2 show ip mcast boundary

Display the administratively scoped IP multicast boundaries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast boundary [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

67.3.3 show ip mcast interface

Display the interface specific information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

67.3.4 show ip mcast mroute static

Display the multicast static routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast mroute static

67.3.5 show ip mcast mroute detail

Display the multicast routing table details.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast mroute detail [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

67.3.6 show ip mcast mroute summary

Display the multicast routing table summary.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip mcast mroute summary [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

68 Media Redundancy Protocol (MRP)

68.1 mrp

Configure the MRP settings.

68.1.1 mrp domain modify advanced-mode

Configure the MRM Advanced Mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify advanced-mode <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

68.1.2 mrp domain modify manager-priority

Configure the MRM priority.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify manager-priority <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter the MRM priority (default: 32768).

68.1.3 mrp domain modify mode

Configure the role of the MRP device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify mode <P-1>

Parameter	Value	Meaning
P-1	client	The device will be in the role of a ring client (MRC).
	manager	The device will be in the role of a ring manager (MRM).

68.1.4 mrp domain modify name

Configure the logical name of the MRP domain.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify name <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

68.1.5 mrp domain modify operation

Enable or disable the MRP function.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

68.1.6 mrp domain modify port primary

Configure the primary ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp domain modify port primary <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

68.1.7 mrp domain modify port secondary

Configure the secondary ring port.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain modify port secondary <P-1> [fixed-backup <P-2>]

[fixed-backup]: Enable or disable the secondary ring port of the manager to be the backup port permanently.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	enable	Enable the option.
	disable	Disable the option.

68.1.8 mrp domain modify recovery-delay

Configure the MRM Recovery Delay.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain modify recovery-delay <P-1>

Parameter	Value	Meaning
P-1	500ms	Maximum recovery delay of 500ms in the MRP domain.
	200ms	Maximum recovery delay of 200ms in the MRP domain.
	30ms	Maximum recovery delay of 30ms in the MRP domain.
	10ms	Maximum recovery delay of 10ms in the MRP domain.

68.1.9 mrp domain modify round-trip-delay

Configure the round-trip-delay counters.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain modify round-trip-delay <P-1>

Parameter	Value	Meaning
P-1	reset	Reset the round-trip-delay counters.

68.1.10 mrp domain modify vlan

Configure the VLAN identifier of the MRP domain. (VLAN ID 0 means that no VLAN is used).

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain modify vlan <P-1>

Parameter	Value	Meaning
P-1	0..4042	VLAN identifier of the MRP domain. (VLAN ID 0 means that no VLAN is used).

68.1.11 mrp domain add default-domain

Default MRP domain ID.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain add default-domain

68.1.12 mrp domain add domain-id

MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain add domain-id <P-1>

Parameter	Value	Meaning
P-1	string	<domain id> MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

68.1.13 mrp domain delete

Delete the current MRP domain.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: mrp domain delete

68.1.14 mrp operation

Enable or disable MRP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp operation

■ no mrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp operation

68.2 show

Display device options and settings.

68.2.1 show mrp

Display the MRP settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp

69 MRP IEEE

69.1 mrp-ieee

Configure IEEE MRP parameters and protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration on a port.

69.1.1 mrp-ieee global join-time

Set the IEEE multiple registration protocol join time-interval. The join timer controls the interval between join message transmissions sent to applicant state machines. An instance of this timer is required on a per-Port, per-MRP participant basis.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee global join-time <P-1>

Parameter	Value	Meaning
P-1	10..100	Join time-interval in centiseconds.

69.1.2 mrp-ieee global leave-time

Set the IEEE multiple registration protocol leave time-interval. The leave timer controls the period of time that the registrar state machine waits in the leave state before transiting to the empty state. An instance of the timer is required for each state machine in the leave state.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee global leave-time <P-1>

Parameter	Value	Meaning
P-1	20..600	Leave time-interval in centiseconds.

69.1.3 mrp-ieee global leave-all-time

Set the IEEE multiple registration protocol leave-all time-interval. The leave all timer controls the frequency with which the leaveall state machine generates leaveall PDUs. The timer is required on a per-Port, per-MRP Participant basis.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee global leave-all-time <P-1>

Parameter	Value	Meaning
P-1	200..6000	Leave-All time-interval in centiseconds.

69.2 show

Display device options and settings.

69.2.1 show mrp-ieee global interface

Display the global configuration of IEEE multiple registration protocol per interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee global interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

70 MRP IEEE MMRP

70.1 mrp-ieee

Configure IEEE MRP protocols.

70.1.1 mrp-ieee mmrp vlan-id

Configure the VLAN parameters.

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: mrp-ieee mmrp vlan-id <P-1> forward-all <P-2> forbidden-servicereq <P-3>

forward-all: Enable or disable 'Forward All Groups' in a given Vlan for a given interface.

forbidden-servicereq: Enable or disable the mmrp feature 'Forbidden Service Requirement' in a given Vlan for a given interface.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	slot no./port no.	
P-3	slot no./port no.	

■ no mrp-ieee mmrp vlan-id

Disable the option

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: no mrp-ieee mmrp vlan-id <P-1> forward-all <P-2> forbidden-servicereq <P-3>

70.2 show

Display device options and settings.

70.2.1 show mrp-ieee mmrp global

Display the IEEE MMRP global configuration.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show mrp-ieee mmrp global

70.2.2 show mrp-ieee mmrp interface

Display the IEEE MMRP interface configuration.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show mrp-ieee mmrp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

70.2.3 show mrp-ieee mmrp statistics global

Display the IEEE MMRP global statistics.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show mrp-ieee mmrp statistics global

70.2.4 show mrp-ieee mmrp statistics interface

Display the IEEE MMRP interface statistics.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show mrp-ieee mmrp statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

70.2.5 show mrp-ieee mmrp service-requirement forward-all vlan

Display the Forward-All setting for port in given VLAN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mmrp service-requirement forward-all vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

70.2.6 show mrp-ieee mmrp service-requirement forbidden vlan

Display the Forward-All setting for port in given VLAN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mmrp service-requirement forbidden vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

70.3 mrp-ieee

Configure IEEE MRP protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration.

70.3.1 mrp-ieee mmrp operation

Enable or disable MMRP globally. Devices use MMRP information for dynamic registration of group membership and individual MAC addresses with end devices and switches that support extended filtering services, within the connected LAN.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mmrp operation

■ no mrp-ieee mmrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp-ieee mmrp operation

70.3.2 mrp-ieee mmrp periodic-machine

Enable or disable MMRP periodic state machine globally. When enabled, the periodic state machine sends extra MMRP messages when the periodic timer expires.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mmrp periodic-machine

■ no mrp-ieee mmrp periodic-machine

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp-ieee mmrp periodic-machine

70.4 clear

Clear several items.

70.4.1 clear mrp-ieee mmrp

Clear the IEEE MMRP global and port statistic tables.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear mrp-ieee mmrp

70.5 mrp-ieee

Configure IEEE MRP parameters and protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration on a port.

70.5.1 mrp-ieee mmrp operation

Enable or disable MMRP on the interface, with MMRP enabled globally and on this interface, the device sends and receives MMRP messages on this port.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: mrp-ieee mmrp operation
-
- no mrp-ieee mmrp operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mrp-ieee mmrp operation

70.5.2 mrp-ieee mmrp restrict-register

Enable or disable restriction of dynamic mac address registration using IEEE MMRP on the port. When enabled, the dynamic registration of mac address attributes is allowed only if the attribute has already been statically registered on the device.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: mrp-ieee mmrp restrict-register
-
- no mrp-ieee mmrp restrict-register
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mrp-ieee mmrp restrict-register

70.6 show

Display device options and settings.

70.6.1 show mac-filter-table mmrp

Display the MMRP entries in the MFDB table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mac-filter-table mmrp

71 MRP IEEE MSRP

71.1 mrp-ieee

Configure IEEE MRP protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration.

71.1.1 mrp-ieee msrp operation

Enable or disable MSRP globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: mrp-ieee msrp operation

■ no mrp-ieee msrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no mrp-ieee msrp operation

71.1.2 mrp-ieee msrp boundary-propagate

Enable or disable the boundary propagation.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: mrp-ieee msrp boundary-propagate

■ no mrp-ieee msrp boundary-propagate

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no mrp-ieee msrp boundary-propagate

71.1.3 mrp-ieee msrp talker-pruning

Enable or disable the talker pruning.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: mrp-ieee msrp talker-pruning

■ no mrp-ieee msrp talker-pruning

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no mrp-ieee msrp talker-pruning

71.1.4 mrp-ieee msrp max-fan-in-ports

Configure the maximum fan-in ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: mrp-ieee msrp max-fan-in-ports <P-1>

Parameter	Value	Meaning
P-1	1..52	The number of the max fan-in ports (default: 12)

71.2 show

Display device options and settings.

71.2.1 show mrp-ieee msrp statistics global

Display the global statistics.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show mrp-ieee msrp statistics global

71.2.2 show mrp-ieee msrp statistics interface

Display the statistics for an interface.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show mrp-ieee msrp statistics interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

71.3 clear

Clear several items.

71.3.1 clear mrp-ieee msrp

Clear all the MSRP statistics.

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** clear mrp-ieee msrp

72 MRP IEEE MVRP

72.1 mrp-ieee

Configure IEEE MRP protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration.

72.1.1 mrp-ieee mvrp operation

Enable or disable IEEE MVRP globally. When enabled, the device distributes VLAN membership information on MVRP enable active ports. MVRP-aware devices use the information to dynamically create VLAN members and update the local VLAN member database.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mvrp operation

■ no mrp-ieee mvrp operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp-ieee mvrp operation

72.1.2 mrp-ieee mvrp periodic-machine

Enable or disable IEEE MVRP periodic state machine globally. When enabled, the device sends MVRP messages to the connected MVRP-aware devices when the periodic timer expires.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mvrp periodic-machine

■ no mrp-ieee mvrp periodic-machine

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp-ieee mvrp periodic-machine

72.2 mrp-ieee

Configure IEEE MRP parameters and protocols, MVRP for dynamic VLAN registration and MMRP for dynamic MAC registration on a port.

72.2.1 mrp-ieee mvrp operation

Enable or disable IEEE MVRP on the port. When enabled, globally and on this port, the device distributes VLAN membership information to MVRP aware devices connected to this port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mvrp operation

■ no mrp-ieee mvrp operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no mrp-ieee mvrp operation

72.2.2 mrp-ieee mvrp restrict-register

Enable or disable restriction of dynamic VLAN registration using IEEE MVRP on the port. When enabled, the dynamic registration of VLAN attributes is allowed only if the attribute has already been statically registered on the device.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mrp-ieee mvrp restrict-register

- no mrp-ieee mvrp restrict-register
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no mrp-ieee mvrp restrict-register

72.3 show

Display device options and settings.

72.3.1 show mrp-ieee mvrp global

Display the IEEE MVRP global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mvrp global

72.3.2 show mrp-ieee mvrp interface

Display the IEEE MVRP interface configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mvrp interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

72.3.3 show mrp-ieee mvrp statistics global

Display the IEEE MVRP global statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mvrp statistics global

72.3.4 show mrp-ieee mvrp statistics interface

Display the IEEE MVRP interface statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mrp-ieee mvrp statistics interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

72.4 clear

Clear several items.

72.4.1 clear mrp-ieee mvrp

Clear the IEEE MVRP global and port statistic tables.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear mrp-ieee mvrp

73 Network Address Translation (NAT)

73.1 nat

Manage NAT rules

73.1.1 nat dnat commit

Commit pending changes for DNAT (commits all NAT changes).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat commit

73.1.2 nat dnat add

Add rule to DNAT

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: nat dnat add <P-1> [cfg <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> [<P-9>]]
- [cfg]: Configure the rule immediately

Parameter	Value	Meaning
P-1	1..255	DNAT rule number
P-2	a.b.c.d	Source IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-3	number	number UDP/TCP Source Port
	nu-nu	nu-nu Port Range
	nu,nu-nu	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-4	a.b.c.d	Destination IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-5	number	number of the UDP/TCP Destination Port
	nu-nu	nu-nu Port Range
	number,number	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-6	a.b.c.d	New destination IP address
P-7	number	number of the UDP/TCP New Destination Port
	any	any Any port (or protocol without a port)
P-8	icmp	Internet Control Message Protocol
	igmp	Internet Group Management Protocol
	ipip	IP-within-IP Encapsulation Protocol
	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	esp	Encapsulating Security Protocol
	ah	Authentication Header
	any	Any of the above
P-9	string	Rule description/name

73.1.3 nat dnat modify

Configure single DNAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat modify <P-1> <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> [<P-9>]

Parameter	Value	Meaning
P-1	1..255	DNAT rule number

Parameter	Value	Meaning
P-2	a.b.c.d	Source IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-3	number	number UDP/TCP Source Port
	nu-nu	nu-nu Port Range
	nu,nu-nu	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-4	a.b.c.d	Destination IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-5	number	number of the UDP/TCP Destination Port
	nu-nu	nu-nu Port Range
	number,number	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-6	a.b.c.d	New destination IP address
P-7	number	number of the UDP/TCP New Destination Port
	any	any Any port (or protocol without a port)
P-8	icmp	Internet Control Message Protocol
	igmp	Internet Group Management Protocol
	ipip	IP-within-IP Encapsulation Protocol
	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	esp	Encapsulating Security Protocol
	ah	Authentication Header
	any	Any of the above
P-9	string	Rule description/name

73.1.4 nat dnat delete

Delete rule from DNAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat delete <P-1>

Parameter	Value	Meaning
P-1	1..255	DNAT rule number

73.1.5 nat dnat logtrap

Set log/trap for DNAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat logtrap <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	1..255	DNAT rule number
P-2	no	Disable Logging
	yes	Enable Logging
P-3	no	Disable SNMP Trap
	yes	Enable SNMP Trap

73.1.6 nat dnat state

Enable/Disable specific DNAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat state <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	DNAT rule number
P-2	enable	Enable the option.
	disable	Disable the option.

73.1.7 nat dnat if add

Add Interface

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat if add <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..255	DNAT rule number
P-3	0..6500	Priority

73.1.8 nat dnat if delete

Delete interface

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat if delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..255	DNAT rule number

73.1.9 nat 1to1nat commit

Commit pending changes for 1:1 NAT (commits every NAT change).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat commit

73.1.10 nat 1to1nat add

Add rule to 1:1 NAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat add <P-1> [cfg <P-2> <P-3> <P-4> [<P-5>]] [ingress <P-6>] [egress <P-7> [<P-8>]]

[cfg]: Configure the rule immediately

[ingress]: Configure ingress interface

[egress]: Configure egress interface

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number
P-2	a.b.c.d	Virtual destination IP address
	a.b.c.d/n	CIDR mask
P-3	a.b.c.d	Actual destination IP address
	a.b.c.d/n	CIDR mask
P-4	0..6500	Priority
P-5	string	[string] Rule description/name
P-6	slot no./port no.	
P-7	slot no./port no.	
P-8	string	Rule description/name

73.1.11 nat 1to1nat modify

Configure single 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat modify <P-1> <P-2> <P-3> <P-4> [ingress <P-5>] [egress <P-6> [<P-7>]] [virtual-address <P-8>] [actual-address <P-9>] [description <P-10>]

[ingress]: Configure ingress interface

[egress]: Configure egress interface

[virtual-address]: Configure virtual destination IP address

[actual-address]: Configure actual destination IP address

[description]: Configure description

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number
P-2	a.b.c.d	Virtual destination IP address
	a.b.c.d/n	CIDR mask
P-3	a.b.c.d	Actual destination IP address
	a.b.c.d/n	CIDR mask

Parameter	Value	Meaning
P-4	0..6500	Priority
P-5	slot no./port no.	
P-6	slot no./port no.	
P-7	string	Rule description/name
P-8	a.b.c.d	Virtual destination IP address
	a.b.c.d/n	CIDR mask
P-9	a.b.c.d	Actual destination IP address
	a.b.c.d/n	CIDR mask
P-10	string	Rule description/name

73.1.12 nat 1to1nat delete

Delete the rule from 1:1 NAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat delete <P-1>

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number

73.1.13 nat 1to1nat logtrap

Set log/trap for 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat logtrap <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number
P-2	no	Disable Logging
	yes	Enable Logging
P-3	no	Disable SNMP Trap
	yes	Enable SNMP Trap

73.1.14 nat 1to1nat state

Enable/Disable specific 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat state <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number
P-2	enable	Enable the option.
	disable	Disable the option.

73.1.15 nat 1to1nat enable

Enable specific 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat enable <P-1>

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number

73.1.16 nat 1to1nat disable

Disable specific 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat disable <P-1>

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number

73.1.17 nat alg

Set the ALG options

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat alg <P-1>

Parameter	Value	Meaning
P-1	xxx_hmcliBitList_nat _alg	???

■ no nat alg

Disable the option

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: no nat alg <P-1>

73.1.18 nat interface

Set the public interface

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

73.1.19 nat masq commit

Commit pending changes for Masquerading (commits every NAT change).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq commit

73.1.20 nat masq add

Add rule to Masquerading

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: nat masq add <P-1> [cfg <P-2> <P-3> <P-4> [<P-5>]]
- [cfg]: Configure the rule immediately

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number
P-2	a.b.c.d	Source IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-3	number	number UDP/TCP Source Port
	nu-nu	nu-nu Port Range
	nu,nu-nu	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-4	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	any	Any protocol at all
P-5	string	Rule description/name

73.1.21 nat masq modify

Configure single Masquerading rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq modify <P-1> <P-2> <P-3> <P-4> [<P-5>]

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number

Parameter	Value	Meaning
P-2	a.b.c.d	Source IP address
	a.b.c.d/n	CIDR mask
	!a.b.c.d	!<a.b.c.d> Everything BUT this address
	!a.b.c.d/n	!<a.b.c.d/n> Everything BUT this CIDR mask
	any	any Any
P-3	number	number UDP/TCP Source Port
	nu-nu	nu-nu Port Range
	nu,nu-nu	nu,nu-nu List of ports (or port ranges)
	any	any Any port (or protocol without a port)
P-4	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	any	Any protocol at all
P-5	string	Rule description/name

73.1.22 nat masq delete

Delete rule from Masquerading

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq delete <P-1>

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number

73.1.23 nat masq logtrap

Set log/trap for Masquerading rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq logtrap <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number
P-2	no	Disable Logging
	yes	Enable Logging
P-3	no	Disable SNMP Trap
	yes	Enable SNMP Trap

73.1.24 nat masq ipsec-exempt

Exclude IPsec traffic from Masquerading rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq ipsec-exempt <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number
P-2	disabled	Apply rule to IPsec traffic
	enabled	Do not apply rule to IPsec traffic

73.1.25 nat masq state

Enable/Disable specific Masquerading rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq state <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number
P-2	enable	Enable the option.
	disable	Disable the option.

73.1.26 nat masq if add

Add interface

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq if add <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..128	Masquerading rule number
P-3	0..4294967295	Priority

73.1.27 nat masq if delete

Delete interface

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq if delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	1..128	Masquerading rule number

73.1.28 nat doublenat commit

Commit pending changes for Double NAT (commits all NAT changes).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat doublenat commit

73.1.29 nat doublenat add

Add rule to Double NAT

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: nat doublenat add <P-1> [cfg <P-2> <P-3> <P-4> <P-5> [<P-6>]]
- [cfg]: Configure the rule immediately

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number
P-2	a.b.c.d	Local internal IP address
P-3	a.b.c.d	Local external IP address
P-4	a.b.c.d	Remote Internal IP Address
P-5	a.b.c.d	Remote External IP Address
P-6	string	Rule description/name

73.1.30 nat doublenat modify

Configure single Double NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat doublenat modify <P-1> <P-2> <P-3> <P-4> <P-5> [<P-6>]

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number
P-2	a.b.c.d	Local internal IP address
P-3	a.b.c.d	Local external IP address
P-4	a.b.c.d	Remote Internal IP Address
P-5	a.b.c.d	Remote External IP Address
P-6	string	Rule description/name

73.1.31 nat doublenat delete

Delete rule from Double NAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat doublenat delete <P-1>

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number

73.1.32 nat doublenat logtrap

Set log/trap for Double NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat doublenat logtrap <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number
P-2	no	Disable Logging
	yes	Enable Logging
P-3	no	Disable SNMP Trap
	yes	Enable SNMP Trap

73.1.33 nat doublenat state

Enable/Disable specific Double NAT rule

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: nat doublenat state <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number
P-2	enable	Enable the option.
	disable	Disable the option.

73.1.34 nat doublenat if add

Add Interface

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: nat doublenat if add <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Ingress
	egress	Egress
	both	Both
P-3	1..255	Double NAT rule number
P-4	0..6500	Priority

73.1.35 nat doublenat if delete

Delete interface

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: nat doublenat if delete <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Ingress
	egress	Egress
	both	Both
P-3	1..255	Double NAT rule number

73.2 show

Display device options and settings.

73.2.1 show nat dnat global

Display the summary.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat dnat global

73.2.2 show nat dnat rules

Display the DNAT rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat dnat rules [<P-1>]

Parameter	Value	Meaning
P-1	1..255	DNAT rule number

73.2.3 show nat dnat if

Display the DNAT interface configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat dnat if

73.2.4 show nat dnat logtrap

Display the Log/Trap settings for the DNAT rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat dnat logtrap [<P-1>]

Parameter	Value	Meaning
P-1	1..255	DNAT rule number

73.2.5 show nat masq global

Display the summary.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat masq global

73.2.6 show nat masq rules

Display the masquerading rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat masq rules [<P-1>]

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number

73.2.7 show nat masq logtrap

Display the Log/Trap settings for the masquerading rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat masq logtrap [<P-1>]

Parameter	Value	Meaning
P-1	1..128	Masquerading rule number

73.2.8 show nat masq if

Display the masquerading interface configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat masq if

73.2.9 show nat 1to1nat global

Display the summary.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat 1to1nat global

73.2.10 show nat 1to1nat rules

Display the 1:1 NAT rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat 1to1nat rules [<P-1>]

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number

73.2.11 show nat 1to1nat logtrap

Display the Log/Trap settings for 1:1 NAT rules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show nat 1to1nat logtrap [<P-1>]

Parameter	Value	Meaning
P-1	1..255	1:1 NAT rule number

73.2.12 show nat doublenat global

Display the summary.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show nat doublenat global

73.2.13 show nat doublenat rules

Display the Double NAT rules.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show nat doublenat rules [<P-1>]

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number

73.2.14 show nat doublenat logtrap

Display the Log/Trap settings for the Double NAT rules.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show nat doublenat logtrap [<P-1>]

Parameter	Value	Meaning
P-1	1..255	Double NAT rule number

73.2.15 show nat doublenat if

Display the Double NAT interface configuration.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show nat doublenat if

74 Network Time Protocol (NTP)

74.1 ntp

Configure NTP settings.

74.1.1 ntp client operation

Enable or disable the NTP client.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp client operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

74.1.2 ntp client operating-mode

Set the NTP client operating mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp client operating-mode <P-1>

Parameter	Value	Meaning
P-1	unicast	Enable NTP client in unicast operating mode.
	broadcast	Enable NTP client in broadcast operating mode.

74.1.3 ntp server operation

Enable or disable the NTP server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp server operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

74.1.4 ntp server operating-mode

Set the NTP server operating mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp server operating-mode <P-1>

Parameter	Value	Meaning
P-1	symmetric	Enable NTP server in symmetric operating mode.
	client-server	Enable NTP server in client-server operating mode.

74.1.5 ntp server localclock-stratum

Set the stratum of the localclock.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp server localclock-stratum <P-1>

Parameter	Value	Meaning
P-1	1..16	Localclock stratum.

74.1.6 ntp peers add

Add a new peer.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: ntp peers add <P-1> ip <P-2> [iburst <P-3>] [burst <P-4>] [prefer <P-5>]
- ip: Set the peer address.
- [iburst]: Speed up the initial synchronization (default: disabled). Used only when operating in client-unicast mode.
- [burst]: Increase the precision on links with high jitter (default: disabled). Used only in client-unicast mode.
- [prefer]: If correctly operating, choose this peer as synchronization source (default: disabled).

Parameter	Value	Meaning
P-1	1..4	NTP servers index.
P-2	A.B.C.D	IP address.
P-3	enable	Enable the option.
	disable	Disable the option.
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	enable	Enable the option.
	disable	Disable the option.

74.1.7 ntp peers delete

Delete a peer.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ntp peers delete <P-1>

Parameter	Value	Meaning
P-1	1..4	NTP servers index.

74.2 show

Display device options and settings.

74.2.1 show ntp client-status

Status of the NTP client connection.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ntp client-status

74.2.2 show ntp server-status

Overall operational status of the NTP server.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ntp server-status

75 OPC/UA Server (IEC62541)

75.1 opc-ua

Configure IEC62541 - OPC/UA server settings.

75.1.1 opc-ua operation

Enable or disable the IEC62541 - OPC/UA server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua operation

- no opc-ua operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no opc-ua operation

75.1.2 opc-ua port

Defines the port number of the IEC62541 - OPC/UA server (default: 4840).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Enter port number between 1 and 65535

75.1.3 opc-ua sessions

Configure the maximum number of sessions of the IEC62541 - OPC/UA server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua sessions <P-1>

Parameter	Value	Meaning
P-1	1..5	Enter a number in the given range.

75.1.4 opc-ua security-policy

Set the security policy of the IEC62541 - OPC/UA server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua security-policy <P-1>

Parameter	Value	Meaning
P-1	none	Set no security policy.
	basic128rsa15	Set security policy as basic128Rsa15.
	basic256	Set security policy as basic256.
	basic256sha256	Set security policy as basic256Sha256.

75.1.5 opc-ua users add

Add a new user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua users add <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name.

75.1.6 opc-ua users delete

Delete an existing user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: opc-ua users delete <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name.

75.1.7 opc-ua users enable

Enable user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `opc-ua users enable <P-1>`

Parameter	Value	Meaning
P-1	string	<user> User name.

75.1.8 opc-ua users disable

Disable user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `opc-ua users disable <P-1>`

Parameter	Value	Meaning
P-1	string	<user> User name.

75.1.9 opc-ua users modify

Modify an existing user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: `opc-ua users modify <P-1> password [<P-2>] access-role <P-3>`

password: Change user password.

access-role: Change user access role.

Parameter	Value	Meaning
P-1	string	<user> User name.
P-2	string	Enter a user-defined text, max. 64 characters.
P-3	read-only	Set access role as read-only.

75.2 show

Display device options and settings.

75.2.1 show opc-ua global

IEC62541 - OPC/UA server settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show opc-ua global`

75.2.2 show opc-ua users

Display the configured users for IEC62541 - OPC/UA server.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show opc-ua users`

76 Out-of-band Management

76.1 network

Configure the inband and outband connectivity.

76.1.1 network out-of-band operation

Enable or disable the out-of-band management.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: network out-of-band operation
-
- no network out-of-band operation
Disable the option
 - ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no network out-of-band operation

76.1.2 network out-of-band protocol

Select DHCP or none as the out-of-band configuration protocol.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network out-of-band protocol <P-1>

Parameter	Value	Meaning
P-1	none	No out-of-band config protocol.
	dhcp	DHCP

76.1.3 network out-of-band parms

Set out-of-band IP address, subnet mask and gateway.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network out-of-band parms <P-1> <P-2> [<P-3>]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

76.1.4 network usb operation

Enable or disable the USB out-of-band management.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: network usb operation
-
- no network usb operation
Disable the option
 - ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no network usb operation

76.1.5 network usb parms

Set USB out-of-band IP address and subnet mask.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network usb parms <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

76.2 show

Display device options and settings.

76.2.1 show network out-of-band

Display the out-of-band management configuration.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show network out-of-band

76.2.2 show network usb

Show USB out-of-band management configuration.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show network usb

77 Packet Filter

77.1 packet-filter

Creation and configuration of Firewall rules.

77.1.1 packet-filter l3 commit

Writes all changes made in the L3 firewall configuration to the device

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 commit

77.1.2 packet-filter l3 defaultpolicy

Sets the default policy of the L3 and DynFw rule tables

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 defaultpolicy <P-1>

Parameter	Value	Meaning
P-1	accept	Accept packets
	drop	Drop packets without notification
	reject	Drop packets and notify source

77.1.3 packet-filter l3 checksum-validation

Configures the connection tracking checksum validation in Netfilter

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 checksum-validation

■ no packet-filter l3 checksum-validation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no packet-filter l3 checksum-validation

77.1.4 packet-filter l3 addrule

Adds a rule to the L3 firewall table

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 addrule <P-1> <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> <P-9> protocol-name <P-10> [description <P-11>] policy-name <P-12> [description <P-13>] [profile-index <P-14>]

protocol-name: Protocol Name

[description]: Rule description/name for the L3 firewall rule

policy-name: Rule policy name for the L3 firewall rule

[description]: Rule description/name for the L3 firewall rule

[profile-index]: Profile index of the DPI profile this rule is assigned to depending on enforcer action. Value 0 no profile this rule is assigned to. You cannot assign the rule to an inactive profile if an active enforcer will mapping to it.

Parameter	Value	Meaning
P-1	1..2048	Rule index
P-2	string	Source IP address/CIDR mask/'any'
P-3	string	Source port/port list with comma/port range with hyphen/'any'
P-4	string	Target IP address/CIDR mask/'any'
P-5	string	Target port/port list with comma/port range with hyphen/'any'

Parameter	Value	Meaning
P-6	icmp	Internet Control Message Protocol
	igmp	Internet Group Management Protocol
	ipip	IP-within-IP Encapsulation Protocol
	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	esp	Encapsulating Security Protocol
	ah	Authentication Header
	any	Any of the above
P-7	string	Parameters for rule (or 'none')
P-8	accept	Accept packets.
	drop	Drop packets without notification.
	reject	Drop packets and notify source.
	enforce-modbus	Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP.
	enforce-opc	Accept or drop packets by OPC enforcer, protocol should be TCP.
	enforce-iec104	Accept or drop packets by IEC104 enforcer, protocol should be TCP.
	enforce-ethernetip	Accept or drop packets by ENIP enforcer, protocol should be TCP.
P-9	enforce-dnp3	Accept or drop packets by DNP3 enforcer, protocol should be TCP.
	accept	Accept packets.
	drop	Drop packets without notification.
	reject	Drop packets and notify source.
P-10	enforce-opc	Accept or drop packets by OPC enforcer, protocol should be TCP.
	string	Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any
	string	Rule description/name
	string	Rule policy name
P-11	string	Rule description/name
P-12	string	Rule description/name
P-13	string	Rule description/name
P-14	0..32	Profile index 0 - 32

77.1.5 packet-filter l3 modifyrule

Modifies a rule to the L3 firewall table

- ▶ **Mode:** Global Config Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** packet-filter l3 modifyrule <P-1> <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> <P-9> [description <P-10>] protocol-name <P-11> [description <P-12>] [policy-name <P-13>]

[description]: Rule description/name for the L3 firewall rule

protocol-name: Protocol Name

[description]: Rule description/name for the L3 firewall rule

[policy-name]: Policy Name for L3 firewall rule

Parameter	Value	Meaning
P-1	1..2048	Rule index
P-2	string	Source IP address/CIDR mask/'any'
P-3	string	Source port/port list with comma/port range with hyphen/'any'
P-4	string	Target IP address/CIDR mask/'any'
P-5	string	Target port/port list with comma/port range with hyphen/'any'
P-6	icmp	Internet Control Message Protocol
	igmp	Internet Group Management Protocol
	ipip	IP-within-IP Encapsulation Protocol
	tcp	Transmission Control Protocol
	udp	User Datagram Protocol
	esp	Encapsulating Security Protocol
	ah	Authentication Header
	any	Any of the above
P-7	string	Parameters for rule (or 'none')
P-8	accept	Accept packets.
	drop	Drop packets without notification.
	reject	Drop packets and notify source.
	enforce-modbus	Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP.
	enforce-opc	Accept or drop packets by OPC enforcer, protocol should be TCP.
	enforce-iec104	Accept or drop packets by IEC104 enforcer, protocol should be TCP.
	enforce-ethernetip	Accept or drop packets by ENIP enforcer, protocol should be TCP.
P-9	enforce-dnp3	Accept or drop packets by DNP3 enforcer, protocol should be TCP.
	accept	Accept packets.
	drop	Drop packets without notification.
	reject	Drop packets and notify source.
P-10	enforce-opc	Accept or drop packets by OPC enforcer, protocol should be TCP.
	string	Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any
	string	Rule description/name
	string	Rule policy name

Parameter	Value	Meaning
P-10	string	Rule description/name
P-11	string	Protocol Name from protocol table or tcp/udp/icmp/igmp/ipp/esp/ah/icmpv6/any
P-12	string	Rule description/name
P-13	string	Rule policy name

77.1.6 packet-filter l3 delrule

Deletes a rule from L3 rule table

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 delrule <P-1>

Parameter	Value	Meaning
P-1	1..2048	Rule index

77.1.7 packet-filter l3 enablerule

Enables a rule from L3 rule table. A rule can only be enabled when all the required parameters are set. You cannot enable a rule if the mapped enforcer's profile is inactive.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 enablerule <P-1>

Parameter	Value	Meaning
P-1	1..2048	Rule index

77.1.8 packet-filter l3 disablerule

Disables a rule from L3 rule table

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 disablerule <P-1>

Parameter	Value	Meaning
P-1	1..2048	Rule index

77.1.9 packet-filter l3 logmode

Set logmode for a rule from L3 rule table

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 logmode <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..2048	Rule index
P-2	log	Log when rule is applied
	trap	Send trap when rule is applied
	logtrap	Log and send trap when rule is applied
	none	Disable log and trap

77.1.10 packet-filter l3 addif

Adds an interface to a L3 firewall rule

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 addif <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Rule applies on ingress direction.
	egress	Rule applies on egress direction.
P-3	1..2048	Rule index
P-4	0..4294967295	Priority

77.1.11 packet-filter l3 delif

Deletes an interface of a L3 firewall rule

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 delif <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Rule applies on ingress direction.
	egress	Rule applies on egress direction.
P-3	1..2048	Rule index

77.1.12 packet-filter l3 enableif

Enables an interface of a L3 firewall rule

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 enableif <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Rule applies on ingress direction.
	egress	Rule applies on egress direction.
P-3	1..2048	Rule index

77.1.13 packet-filter l3 disableif

Disables an interface of a L3 firewall rule

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: packet-filter l3 disableif <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	ingress	Rule applies on ingress direction.
	egress	Rule applies on egress direction.
P-3	1..2048	Rule index

77.2 clear

Clear several items.

77.2.1 clear fw-state-table

Clear Firewall connection tracking table.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear fw-state-table

77.3 show

Display device options and settings.

77.3.1 show packet-filter l3 global

Display the packet-filter global information and settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 global

77.3.2 show packet-filter l3 maxrules

Max. number of allowed rules in L3 rule table

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 maxrules

77.3.3 show packet-filter l3 defaultpolicy

Default policy (accept(1), drop(2), reject(3))

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 defaultpolicy

77.3.4 show packet-filter l3 ruletable

Display the L3 rule table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 ruletable

77.3.5 show packet-filter l3 iftable

Display the L3 interface mapping table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 iftable

77.3.6 show packet-filter l3 pending

Display whether uncommitted changes for L3 exist.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show packet-filter l3 pending

78 Private VLAN

78.1 private-vlan

VLAN to be configured as private VLAN.

78.1.1 private-vlan vlan-id

Existing VLAN ID.

- ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: private-vlan vlan-id <P-1> type <P-2>
- type: Set Private Vlan type.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	primary	Set the vlan type as primary.
	isolated	Set the vlan type as isolated.
	community	Set the vlan type as community.
	unconfigured	Set the vlan type as unconfigured.

78.1.2 private-vlan add associate primary

Existing Primary VLAN.

- ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: private-vlan add associate primary <P-1> secondary <P-2>
- secondary: Existing Secondary VLAN/VLANs.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	Comma Separated Existing Secondary VLAN/VLANs.

78.1.3 private-vlan delete associate primary

Existing Primary VLAN.

- ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: private-vlan delete associate primary <P-1> secondary <P-2>
- secondary: Comma Separated Secondary VLAN/VLANs.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	Comma Separated Existing Secondary VLAN/VLANs.

78.2 switchport

Set the switchport status of a port.

78.2.1 switchport mode private-vlan

Configuration for Private VLAN

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: switchport mode private-vlan <P-1>

Parameter	Value	Meaning
P-1	general	Set the port mode as General.
	host	Set the port mode as Host.
	promiscuous	set the port mode as Promiscuous.

78.2.2 switchport private-vlan add host-assoc primary

Primary VLAN

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: switchport private-vlan add host-assoc primary <P-1> secondary <P-2>

secondary: secondary VLAN

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	1..4042	Enter the VLAN ID.

78.2.3 switchport private-vlan add promiscuous-assoc primary

Primary VLAN

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: switchport private-vlan add promiscuous-assoc primary <P-1> secondary <P-2>
secondary: comma sepearated secondary VLANs

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	Comma Separated Existing Secondary VLAN/VLANs.

78.2.4 switchport private-vlan delete host-assoc primary

Primary VLAN

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: switchport private-vlan delete host-assoc primary <P-1> secondary <P-2>
secondary: secondary VLAN

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	1..4042	Enter the VLAN ID.

78.2.5 switchport private-vlan delete promiscuous-assoc primary

Primary VLAN

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: switchport private-vlan delete promiscuous-assoc primary <P-1> secondary <P-2>
secondary: comma sepearated secondary VLANs

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	Comma Separated Existing Secondary VLAN/VLANs.

78.3 show

Display device options and settings.

78.3.1 show vlan private-vlan

Display the Private vlan configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan private-vlan [<P-1>]

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

79 Protocol Based VLAN

79.1 vlan

Creation and configuration of VLANS.

79.1.1 vlan protocol group add

Add a new group or add protocols to an existing group.

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: vlan protocol group add <P-1> name <P-2> vlan-id <P-3> ethertype <P-4>

name: Assign a group name .

vlan-id: Associate a VLAN ID to a group.

ethertype: Add protocols to an existing group. Before adding protocols to a group please create one.

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.
P-2	string	Enter 0 to 16 alpha numerical characters.
P-3	1..4042	Enter the VLAN ID.
P-4	string	<protocol-list> Enter a comma-separated list of mnemonics or values, max. 256 chars (eg.: 1536-65535, ip, arp, ipx). Hexadecimal values are entered with a leading \'0x\' , eg. 0x600-0xffff.

■ no vlan protocol group add

Disable the option

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: no vlan protocol group add name vlan-id ethertype <P-4>

79.1.2 vlan protocol group modify

Modify a protocol group.

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: vlan protocol group modify <P-1> [name <P-2>] [vlan-id <P-3>] [ethertype <P-4>]

[name]: Modify the group name.

[vlan-id]: Modify the VLAN ID of a group.

[ethertype]: Modify etherypes from a protocol group.

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.
P-2	string	Enter 0 to 16 alpha numerical characters.
P-3	1..4042	Enter the VLAN ID.
P-4	string	<protocol-list> Enter a comma-separated list of mnemonics or values, max. 256 chars (eg.: 1536-65535, ip, arp, ipx). Hexadecimal values are entered with a leading \'0x\' , eg. 0x600-0xffff.

79.1.3 vlan protocol group delete

Delete a protocol group.

► Mode: VLAN Database Mode

► Privilege Level: Operator

► Format: vlan protocol group delete <P-1> [ethertype <P-2>]

[ethertype]: Remove etherypes from a protocol group.

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.
P-2	string	<protocol-list> Enter a comma-separated list of mnemonics or values, max. 256 chars (eg.: 1536-65535, ip, arp, ipx). Hexadecimal values are entered with a leading \'0x\' , eg. 0x600-0xffff.

79.2 vlan

Configure 802.1Q port parameters for VLANs.

79.2.1 vlan protocol group add

Add this interface to a group.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan protocol group add <P-1>

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.

79.2.2 vlan protocol group delete

Remove this interface from a group.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan protocol group delete <P-1>

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.

79.3 show

Display device options and settings.

79.3.1 show vlan protocol

Display the protocol based VLANs summary information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan protocol [<P-1>]

Parameter	Value	Meaning
P-1	1..128	Protocol based VLANs group index.

80 Protocol Independent Multicast (PIM)

80.1 ip

Set IP parameters.

80.1.1 ip pim dense operation

Enable or disable the PIM-DM globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim dense operation

■ no ip pim dense operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip pim dense operation

80.1.2 ip pim dense holdtimes

Configure the value in seconds inserted into the Holdtime field of a Prune message sent on any interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim dense holdtimes <P-1>

Parameter	Value	Meaning
P-1	60.64800	Enter the holdtimes value (default: 210).

80.1.3 ip pim sparse operation

Enable or disable the PIM-SM globally.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse operation

■ no ip pim sparse operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip pim sparse operation

80.1.4 ip pim sparse ssm add

Create a SSM entry for the PIM-SM router.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse ssm add <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.5 ip pim sparse ssm enable

Enable SSM admin mode for specified entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse ssm enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.6 ip pim sparse ssm disable

Disable SSM admin mode for specified entr.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse ssm disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.7 ip pim sparse ssm delete

Delete a SSM entry for the PIM-SM router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse ssm delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.8 ip pim sparse rp-address add

Create a static RP for the PIM-SM router.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip pim sparse rp-address add <P-1> <P-2> address <P-3> [override <P-4>]

address: Set the RP address.

[override]: Change the dynamic override option.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	
P-3	A.B.C.D	IP address.
P-4	true	True
	false	False

80.1.9 ip pim sparse rp-address modify

Modify a static RP for the PIM-SM router.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: ip pim sparse rp-address modify <P-1> <P-2> [address <P-3>] [override <P-4>]
[address]: Set the RP address.

[override]: Change the dynamic override option.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	
P-3	A.B.C.D	IP address.
P-4	true	True
	false	False

80.1.10 ip pim sparse rp-address delete

Delete a static RP for the PIM-SM router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-address delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.11 ip pim sparse rp-address enable

Enable RP static admin mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse rp-address enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.12 ip pim sparse rp-address disable

Disable RP static admin mode.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-address disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

Parameter	Value	Meaning
P-2	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.13 ip pim sparse rp-candidate add

Set a local IP address as RP candidate.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-candidate add <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

Parameter	Value	Meaning
P-3	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.14 ip pim sparse rp-candidate delete

Delete an RP candidate from PIM-SM router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-candidate delete <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

Parameter	Value	Meaning
P-3	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.15 ip pim sparse rp-candidate enable

Enable an RP candidate from PIM-SM router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-candidate enable <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

Parameter	Value	Meaning
P-3	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.16 ip pim sparse rp-candidate disable

Disable an RP candidate from PIM-SM router.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip pim sparse rp-candidate disable <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

Parameter	Value	Meaning
P-3	0.0.0.0	
	128.0.0.0	
	192.0.0.0	
	224.0.0.0	
	240.0.0.0	
	248.0.0.0	
	252.0.0.0	
	254.0.0.0	
	255.0.0.0	
	255.128.0.0	
	255.192.0.0	
	255.224.0.0	
	255.240.0.0	
	255.248.0.0	
	255.252.0.0	
	255.254.0.0	
	255.255.0.0	
	255.255.128.0	
	255.255.192.0	
	255.255.224.0	
	255.255.240.0	
	255.255.248.0	
	255.255.252.0	
	255.255.254.0	
	255.255.255.0	
	255.255.255.128	
	255.255.255.192	
	255.255.255.224	
	255.255.255.240	
	255.255.255.248	
	255.255.255.252	
	255.255.255.254	
	255.255.255.255	

80.1.17 ip pim sparse bsr-candidate add

Add the bootstrap candidate option.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: ip pim sparse bsr-candidate add <P-1> address <P-2> [hash-mask <P-3>] [bsm-interval <P-4>] [priority <P-5>]
- address: Set a local IP address as BSR candidate.
[hash-mask]: Set BSR candidate hash-mask length.
[bsm-interval]: Set BSR advertisement interval.
[priority]: Set BSR candidate priority.

Parameter	Value	Meaning
P-1	1..4294967295	Enter the zone index.
P-2	A.B.C.D	IP address.
P-3	0..128	Enter a number in the given range.
P-4	1..16383	Enter a number in the given range.
P-5	0..255	Enter a number in the given range.

80.1.18 ip pim sparse bsr-candidate modify

Modify the bootstrap candidate parameters.

- Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: ip pim sparse bsr-candidate modify <P-1> address <P-2> hash-mask <P-3> bsm-interval <P-4> priority <P-5>
- address: Set a local IP address as BSR candidate.
hash-mask: Set BSR candidate hash-mask length.
bsm-interval: Set BSR advertisement interval.
priority: Set BSR candidate priority.

Parameter	Value	Meaning
P-1	1..4294967295	Enter the zone index.
P-2	A.B.C.D	IP address.
P-3	0..128	Enter a number in the given range.

Parameter	Value	Meaning
P-4	1..16383	Enter a number in the given range.
P-5	0..255	Enter a number in the given range.

80.1.19 ip pim sparse bsr-candidate delete

Delete the bootstrap candidate option.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse bsr-candidate delete <P-1>

Parameter	Value	Meaning
P-1	1..4294967295	Enter the zone index.

80.1.20 ip pim sparse bsr-candidate enable

Enable the bootstrap candidate option.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse bsr-candidate enable <P-1>

Parameter	Value	Meaning
P-1	1..4294967295	Enter the zone index.

80.1.21 ip pim sparse bsr-candidate disable

Disable the bootstrap candidate option.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse bsr-candidate disable <P-1>

Parameter	Value	Meaning
P-1	1..4294967295	Enter the zone index.

80.1.22 ip pim trapflag

Enable or disable PIM related traps.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim trapflag

■ no ip pim trapflag

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip pim trapflag

80.2 ip

IP interface commands.

80.2.1 ip pim operation

Enable or disable PIM on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim operation

■ no ip pim operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip pim operation

80.2.2 ip pim hello-interval

Configure the hello interval in seconds on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim hello-interval <P-1>

Parameter	Value	Meaning
P-1	0..18000	Enter the hello interval (default: 30).

80.2.3 ip pim sparse bsr-border

Configure BSR Border for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse bsr-border

- no ip pim sparse bsr-border
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip pim sparse bsr-border

80.2.4 ip pim sparse dr-priority

Configure DR priority for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse dr-priority <P-1>

Parameter	Value	Meaning
P-1	0..4294967294	Enter the designated router priority (default: 1).

80.2.5 ip pim sparse join-prune-interval

Configure the join/prune interval for the interface in seconds.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip pim sparse join-prune-interval <P-1>

Parameter	Value	Meaning
P-1	0..18000	Enter the join-prune interval (default: 30).

80.3 show

Display device options and settings.

80.3.1 show ip pim global

Display the PIM global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim global

80.3.2 show ip pim interface

Display the PIM interface status parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

80.3.3 show ip pim neighbor

Display the PIM neighbors information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim neighbor [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

80.3.4 show ip pim rp static

Display the static RP information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim rp static

80.3.5 show ip pim rp mapping

Display the group to RP mapping info.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim rp mapping [<P-1>]

Parameter	Value	Meaning
P-1	fixed	
	static	
	config-ssm	
	bsr	
	auto-rp	
	embedded	
	static-override	

80.3.6 show ip pim rp candidate

Display the RP candidate info.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim rp candidate

80.3.7 show ip pim bsr candidate

Display the BSR candidate information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim bsr candidate

80.3.8 show ip pim bsr elected

Display the BSR elected information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim bsr elected

80.3.9 show ip pim ssm

Display the information regarding SSM.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim ssm

80.3.10 show ip pim rp-hash

Display the PIM-SM RP information for a specific group.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip pim rp-hash <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

81 Power Over Ethernet (PoE)

81.1 inlinepower

Configure the global inline power settings.

81.1.1 inlinepower operation

Configure the global inline power administrative setting (enable or disable, default: enable).

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: inlinepower operation
- no inlinepower operation
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no inlinepower operation

81.1.2 inlinepower slot

Configure the inline power notification (trap), threshold and power budget per slot

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: inlinepower slot <P-1> budget <P-2> threshold <P-3> trap
- budget: Configure the inline power budget per slot
threshold: Configure the inline power notification (trap) threshold per slot.
trap: Configure the inline power notification (trap) setting per slot.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	0..65507	Enter a number in the given range.
P-3	1..99	Enter a number in the given range.

- no inlinepower slot
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no inlinepower slot budget threshold trap

81.1.3 inlinepower threshold

Configure the global inline power notification (trap) threshold.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower threshold <P-1>

Parameter	Value	Meaning
P-1	1..99	Enter a number in the given range.

81.1.4 inlinepower trap

Configure the global inline power notification (trap) setting .

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: inlinepower trap
- no inlinepower trap
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no inlinepower trap

81.2 inlinepower

Configure inline power interface settings.

81.2.1 inlinepower allowed-classes add

Add the class to this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower allowed-classes add <P-1>

Parameter	Value	Meaning
P-1	0	Class 0
	1	Class 1
	2	Class 2
	3	Class 3
	4	Class 4

81.2.2 inlinepower allowed-classes delete

Remove the class from this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower allowed-classes delete <P-1>

Parameter	Value	Meaning
P-1	0	Class 0
	1	Class 1
	2	Class 2
	3	Class 3
	4	Class 4

81.2.3 inlinepower auto-shutdown-end

Configure the interface-related inline power autoshutdown end time.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower auto-shutdown-end <P-1>

Parameter	Value	Meaning
P-1	string	Enter 5 alpha numerical characters (format 00:00).

81.2.4 inlinepower auto-shutdown-start

Configure the interface-related inline power autoshutdown start time.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower auto-shutdown-start <P-1>

Parameter	Value	Meaning
P-1	string	Enter 5 alpha numerical characters (format 00:00).

81.2.5 inlinepower auto-shutdown-timer

Configure the interface-related inline power autoshutdown timer functionality.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower auto-shutdown-timer

■ no inlinepower auto-shutdown-timer

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no inlinepower auto-shutdown-timer

81.2.6 inlinepower operation

Configure the interface-related inline power administrative setting (enable or disable, default: enable).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower operation

- no inlinepower operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no inlinepower operation

81.2.7 inlinepower name

Configure the interface-related inline power interface name.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower name <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

81.2.8 inlinepower priority

Configure the inline power priority for this interface. In case of power scarcity, inline power on interfaces configured with the lowest priority is dropped first. Possible values are: critical, high or low, default: low. The highest priority is critical.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower priority <P-1>

Parameter	Value	Meaning
P-1	crit.	Set this interfaces' inline power priority to critical (highest).
	high	Set this interfaces' inline power priority to high.
	low	Set this interfaces' inline power priority to low. This is the default setting.

81.2.9 inlinepower fast-startup

Enable or disable fast startup.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower fast-startup

- no inlinepower fast-startup
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no inlinepower fast-startup

81.2.10 inlinepower power-limit

Configure the interface related inline maximum power that is reserved for a connected powered device (PD). The power limit is ignored if it is set to 0 or it is exceeded by the maximum observed power consumption.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: inlinepower power-limit <P-1>

Parameter	Value	Meaning
P-1	0.000..30.000	PoE power limit in watts (e.g. 12.54).

81.3 show

Display device options and settings.

81.3.1 show inlinepower global

Display the inline power global settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show inlinepower global

81.3.2 show inlinepower port

Display the interface-related inline power settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show inlinepower port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

81.3.3 show inlinepower slot

Display the slot-related inline power settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show inlinepower slot [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

82 Port Monitor

82.1 port-monitor

Configure the Port Monitor condition settings.

82.1.1 port-monitor operation

Enable or disable the port monitor.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: port-monitor operation
-
- no port-monitor operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no port-monitor operation

82.2 port-monitor

Configure the Port Monitor condition settings.

82.2.1 port-monitor condition crc-fragments interval

Configure the measure interval in seconds (5-180s) for CRC-Fragment detection. Default 10.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition crc-fragments interval <P-1>

Parameter	Value	Meaning
P-1	5..180	Enter a number in the given range.

82.2.2 port-monitor condition crc-fragments count

Configure the CRC-Fragment counter in parts per million (1-1000000 [ppm]). Default 1000 [ppm].

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition crc-fragments count <P-1>

Parameter	Value	Meaning
P-1	1..1000000	Enter a number in the given range.

82.2.3 port-monitor condition crc-fragments mode

Enable or disable CRC-Fragments condition to trigger an action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition crc-fragments mode

- no port-monitor condition crc-fragments mode
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no port-monitor condition crc-fragments mode

82.2.4 port-monitor condition link-flap interval

Configure the measure interval in seconds (1-180s) for Link Flap detection. Default 10.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition link-flap interval <P-1>

Parameter	Value	Meaning
P-1	1..180	Enter a number in the given range.

82.2.5 port-monitor condition link-flap count

Configure the Link Flap counter (1-100). Default 5.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition link-flap count <P-1>

Parameter	Value	Meaning
P-1	1..100	Enter a number in the given range.

82.2.6 port-monitor condition link-flap mode

Enable or disable link-flap condition to trigger an action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition link-flap mode

■ no port-monitor condition link-flap mode

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-monitor condition link-flap mode

82.2.7 port-monitor condition duplex-mismatch mode

Enable or disable duplex mismatch detection condition to trigger an action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition duplex-mismatch mode

■ no port-monitor condition duplex-mismatch mode

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-monitor condition duplex-mismatch mode

82.2.8 port-monitor condition overload-detection traffic-type

Configure Overload detection condition traffic type.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection traffic-type <P-1>

Parameter	Value	Meaning
P-1	all	All packets.
	bc	Broadcast packets.
	bc-mc	Broadcast and multicast packets.

82.2.9 port-monitor condition overload-detection unit

Configure Overload detection condition threshold type.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection unit <P-1>

Parameter	Value	Meaning
P-1	pps	Packets per second.
	kbps	Kilobits per second.

82.2.10 port-monitor condition overload-detection upper-threshold

Configure Overload detection condition threshold type upper-threshold.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection upper-threshold <P-1>

Parameter	Value	Meaning
P-1	0..10000000	Enter a number in the given range.

82.2.11 port-monitor condition overload-detection lower-threshold

Configure Overload detection condition threshold type lower-threshold.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection lower-threshold <P-1>

Parameter	Value	Meaning
P-1	0..10000000	Enter a number in the given range.

82.2.12 port-monitor condition overload-detection polling-interval

Configure Overload detection condition detection interval.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection polling-interval <P-1>

Parameter	Value	Meaning
P-1	1..20	Enter a number in the given range.

82.2.13 port-monitor condition overload-detection mode

Enable or disable Overload-Detection condition to trigger an action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition overload-detection mode

■ no port-monitor condition overload-detection mode

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-monitor condition overload-detection mode

82.2.14 port-monitor condition speed-duplex mode

Enable or disable link speed and duplex condition to trigger an action.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition speed-duplex mode

■ no port-monitor condition speed-duplex mode

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-monitor condition speed-duplex mode

82.2.15 port-monitor condition speed-duplex speed

Set speed-duplex combination.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition speed-duplex speed [<P-1>] [<P-2>] [<P-3>] [<P-4>] [<P-5>] [<P-6>] [<P-7>]

Parameter	Value	Meaning
P-1	[hdx10]	10 Mbit/s - half duplex
P-2	[fdx10]	10 Mbit/s - full duplex
P-3	[hdx100]	100 Mbit/s - half duplex
P-4	[fdx100]	100 Mbit/s - full duplex
P-5	[fdx-1000]	1000 Mbit/s - full duplex
P-6	[fdx-2500]	2500 Mbit/s - full duplex
P-7	[fdx-1000]0	1000 Mbit/s - full duplex

82.2.16 port-monitor condition speed-duplex clear

Clear the allowed speed-duplex combination list.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor condition speed-duplex clear

82.2.17 port-monitor action

Enable or disable interface on port condition.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor action <P-1>

Parameter	Value	Meaning
P-1	port-disable	Disable interface on port condition.
	trap-only	Send only a trap.
	auto-disable	Enable or disable interface on port condition by AUTODIS.

82.2.18 port-monitor reset

Reset the port monitor.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-monitor reset [<P-1>]

Parameter	Value	Meaning
P-1	port	Press Enter to execute the command.

- no port-monitor reset
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no port-monitor reset [<P-1>]

82.3 show

Display device options and settings.

82.3.1 show port-monitor operation

Display the Port Monitor operation.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor operation

82.3.2 show port-monitor brief

Display the Port Monitor summary.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor brief

82.3.3 show port-monitor overload-detection counters

Display the overload-detection counters of last interval.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor overload-detection counters

82.3.4 show port-monitor overload-detection port

Display the Port Monitor overload detection interface details.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor overload-detection port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

82.3.5 show port-monitor speed-duplex

Display the Port Monitor link speed and duplex interface settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor speed-duplex [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

82.3.6 show port-monitor port

Display the Port Monitor interface details.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

82.3.7 show port-monitor link-flap

Display the link-flaps counts for a specific interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor link-flap <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

82.3.8 show port-monitor crc-fragments

Display CRC-Fragments counts for a specific interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-monitor crc-fragments <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

83 Port Security

83.1 port-security

Port security

83.1.1 port-security operation

Enable/Disable port security.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security operation

■ no port-security operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-security operation

83.1.2 port-security mode

Configure the port security operation mode (MAC/IP based).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security mode <P-1>

Parameter	Value	Meaning
P-1	mac-based	Port security is based on given, allowed source MAC addresses.
	ip-based	Port security is based on given, allowed source IP addresses.

■ no port-security mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-security mode <P-1>

83.2 port-security

Port security

83.2.1 port-security operation

Enable/Disable port security on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security operation

■ no port-security operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no port-security operation

83.2.2 port-security max-dynamic

Set dynamic limit for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security max-dynamic <P-1>

Parameter	Value	Meaning
P-1	0..600	Maximum number of dynamically locked MAC addresses.

83.2.3 port-security max-static

Set static limit for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security max-static <P-1>

Parameter	Value	Meaning
P-1	0..64	Maximum number of statically locked addresses.

83.2.4 port-security mac-address add

Add static MAC address to the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security mac-address add <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	1..4042	VLAN ID

83.2.5 port-security mac-address move

Make dynamic MAC addresses static for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security mac-address move

83.2.6 port-security mac-address delete

Remove Static MAC address from the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security mac-address delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	aa:bb:cc:dd:ee:ff	MAC address.
P-2	1..4042	VLAN ID

83.2.7 port-security ip-address add

Add static IP address to the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security ip-address add <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..4042	VLAN ID

83.2.8 port-security ip-address delete

Remove static IP address from the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security ip-address delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..4042	VLAN ID

83.2.9 port-security violation-traps

SNMP violation traps for the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: port-security violation-traps operation [frequency <P-1>]
operation: Enable/Disable SNMP violation traps for the interface.
[frequency]: The minimum seconds between two successive violation traps on this port.

Parameter	Value	Meaning
P-1	0..3600	time in seconds

- no port-security violation-traps
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no port-security violation-traps operation [frequency]

83.3 show

Display device options and settings.

83.3.1 show port-security global

Port Security global status

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-security global

83.3.2 show port-security interface

Display the port security information for the interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-security interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

83.3.3 show port-security dynamic

Display the dynamically learned MAC addresses.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-security dynamic <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

83.3.4 show port-security static

Display the statically locked MAC addresses.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-security static <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

83.3.5 show port-security violation

Display the port security violation information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show port-security violation <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

84 Profinet IO

84.1 profinet

Configures the PROFINET functionality on this device.

84.1.1 profinet operation

Enables or disables the PROFINET functionality on this device.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: profinet operation
-
- no profinet operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no profinet operation

84.1.2 profinet name-of-station

Sets the name of the station.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: profinet name-of-station <P-1>

Parameter	Value	Meaning
P-1	string	Enter the name of the station, alphanumeric ascii string, max. 240 characters.

84.2 profinet

Configures the PROFINET functionality on this device.

84.2.1 profinet dcp-mode

Sets the PROFINET DCP mode on an interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: profinet dcp-mode <P-1>

Parameter	Value	Meaning
P-1	none	Sets the PROFINET DCP mode on an interface to none (neither ingress or egress). The agent does not respond to frames received on this interface. The interface does not forward frames received on other interfaces.
	ingress	Sets the PROFINET DCP mode on an interface to ingress only. The agent responds to frames received on this interface. The interface does not forward frames received on other interfaces.
	egress	Sets the PROFINET DCP mode on an interface to egress only. The agent does not respond to frames received on this interface. The interface forwards frames received on other interfaces.
	both	Sets the PROFINET DCP mode on an interface to both (ingress and egress). The agent responds to frames received on this interface. The interface forwards frames received on other interfaces.

84.3 copy

Copy different kinds of items.

84.3.1 copy gsdml-profinet system remote

Copy the GSDML file from the device to the file server

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** copy gsdml-profinet system remote <P-1> [source-interface <P-2>]
[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

84.3.2 copy gsdml-profinet system envm

Copy the GSDML file from the device to external non-volatile memory.

- ▶ **Mode:** Privileged Exec Mode
- ▶ **Privilege Level:** Operator
- ▶ **Format:** copy gsdml-profinet system envm

84.4 show

Display device options and settings.

84.4.1 show profinet global

Display the PROFINET global settings.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show profinet global

84.4.2 show profinet port

Display the port-related PROFINET settings.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show profinet port

85 Precision Time Protocol (PTP)

85.1 ptp

Enable or disable the Precision Time Protocol (IEEE 1588-2008).

85.1.1 ptp operation

Enable or disable the Precision Time Protocol (IEEE 1588-2008).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp operation
- no ptp operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ptp operation

85.1.2 ptp clock-mode

Configure PTPv2 (IEEE1588-2008) clock mode. If the clock mode is changed, PTP will be initialized.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp clock-mode <P-1>

Parameter	Value	Meaning
P-1	v2-boundary-clock	Specifies V2 boundary clock as mode for the local clock.
	v2-transparent-clock	Specifies V2 transparent clock as mode for the local clock.

85.1.3 ptp sync-lower-bound

Configure the lower bound for the PTP clock synchronization status in nanoseconds. If the absolute value of the offset to the master clock is smaller than the lower bound, clock's status is set to synchronized (true).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp sync-lower-bound <P-1>

Parameter	Value	Meaning
P-1	1..999999999	

85.1.4 ptp sync-upper-bound

Configure the upper bound for the PTP clock synchronization status in nanoseconds. If the absolute value of the offset to the master clock is bigger than the upper bound, the clock's status is set to unsynchronized (false).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp sync-upper-bound <P-1>

Parameter	Value	Meaning
P-1	31..1000000000	

85.1.5 ptp management

Enable or disable PTP management via PTP management messages.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp management
- no ptp management
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ptp management

85.1.6 ptp v2-transparent-clock syntonization

Enable or disable the syntonization (frequency synchronization) of the transparent-clock.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock syntonization

■ no ptp v2-transparent-clock syntonization

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no ptp v2-transparent-clock syntonization

85.1.7 ptp v2-transparent-clock network-protocol

Configure the network-protocol of the transparent-clock.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock network-protocol <P-1>

Parameter	Value	Meaning
P-1	ieee802.3	
	udp-ipv4	

85.1.8 ptp v2-transparent-clock multi-domain

Enable or disable the transparent-clock to process only the primary-domain or all domain numbers.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock multi-domain

■ no ptp v2-transparent-clock multi-domain

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no ptp v2-transparent-clock multi-domain

85.1.9 ptp v2-transparent-clock sync-local-clock

Enable or disable synchronization of the local clock (also enables syntonization).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock sync-local-clock

■ no ptp v2-transparent-clock sync-local-clock

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no ptp v2-transparent-clock sync-local-clock

85.1.10 ptp v2-transparent-clock delay-mechanism

Configure the delay mechanism of the transparent-clock.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock delay-mechanism <P-1>

Parameter	Value	Meaning
P-1	e2e	
	p2p	
	e2e-optimized	
	disable	

85.1.11 ptp v2-transparent-clock primary-domain

Configure the primary-domain (for syntonization) of the transparent-clock.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock primary-domain <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

85.1.12 ptp v2-transparent-clock vlan

VLAN in which PTP packets are send. With a value of none all packets are send untagged.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock vlan <P-1>

Parameter	Value	Meaning
P-1	vlanId	Send ptp to vlanId Use 0 for priority only tagged frames
	none	Send all ptp packets untagged

85.1.13 ptp v2-transparent-clock vlan-priority

VLAN priority of tagged ptp packets.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock vlan-priority <P-1>

Parameter	Value	Meaning
P-1	0..7	

85.1.14 ptp v2-boundary-clock domain

Configure the PTP domain number (0..255)

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock domain <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

85.1.15 ptp v2-boundary-clock priority1

Configure the priority1 value (0..255) for the BMCA

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock priority1 <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

85.1.16 ptp v2-boundary-clock priority2

Configure the priority2 value (0..255) for the BMCA

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock priority2 <P-1>

Parameter	Value	Meaning
P-1	0..255	Enter a number in the given range.

85.1.17 ptp v2-boundary-clock utc-offset

Configure the current UTC offset (TAI - UTC) in seconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock utc-offset <P-1>

Parameter	Value	Meaning
P-1	-32768..32767	

85.1.18 ptp v2-boundary-clock utc-offset-valid

Configure the UTC offset valid flag

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock utc-offset-valid <P-1>

Parameter	Value	Meaning
P-1	true	True
	false	False

- no ptp v2-boundary-clock utc-offset-valid
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ptp v2-boundary-clock utc-offset-valid <P-1>

85.2 ptp

Enable or disable the Precision Time Protocol (IEEE 1588-2008) on a port.

85.2.1 ptp v2-transparent-clock operation

Enable or disable the sending and receiving / processing of PTP synchronization messages.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock operation

- no ptp v2-transparent-clock operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ptp v2-transparent-clock operation

85.2.2 ptp v2-transparent-clock asymmetry

Set the asymmetry of the link connected to this interface

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock asymmetry <P-1>

Parameter	Value	Meaning
P-1	-	
	2000000000..200000	
	0000	

85.2.3 ptp v2-transparent-clock pdelay-interval

Configure the Peer Delay Interval in seconds {1|2|4|8|16|32}. This interval is used if delay-mechanism is set to p2p

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-transparent-clock pdelay-interval <P-1>

Parameter	Value	Meaning
P-1	1	
	2	
	4	
	8	
	16	
	32	

85.2.4 ptp v2-boundary-clock operation

Enable or disable the sending and receiving/processing of PTP synchronization messages.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: ptp v2-boundary-clock operation
- no ptp v2-boundary-clock operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ptp v2-boundary-clock operation

85.2.5 ptp v2-boundary-clock pdelay-interval

Configure the Peer Delay Interval in seconds {1|2|4|8|16|32}. This interval is used if delay-mechanism is set to p2p

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock pdelay-interval <P-1>

Parameter	Value	Meaning
P-1	1	
	2	
	4	
	8	
	16	
	32	

85.2.6 ptp v2-boundary-clock announce-interval

Configure the Announce Interval in seconds {1|2|4|8|16}.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock announce-interval <P-1>

Parameter	Value	Meaning
P-1	1	
	2	
	4	
	8	
	16	

85.2.7 ptp v2-boundary-clock sync-interval

Configure the Sync Interval in seconds {0.25|0.5|1|2}.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock sync-interval <P-1>

Parameter	Value	Meaning
P-1	0.125	
	0.25	
	0.5	
	1	
	2	

85.2.8 ptp v2-boundary-clock announce-timeout

Configure the Announce Receipt Timeout (2..10).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock announce-timeout <P-1>

Parameter	Value	Meaning
P-1	2..10	

85.2.9 ptp v2-boundary-clock asymmetry

Set the asymmetry of the link connected to this interface

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock asymmetry <P-1>

Parameter	Value	Meaning
P-1	-	
	2000000000..2000000000	

85.2.10 ptp v2-boundary-clock v1-compatibility-mode

Set the PTPv1 Hardware compatibility mode {auto|on|off}.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock v1-compatibility-mode <P-1>

Parameter	Value	Meaning
P-1	on	
	off	
	auto	

85.2.11 ptp v2-boundary-clock delay-mechanism

Configure the delay mechanism of the boundary-clock.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock delay-mechanism <P-1>

Parameter	Value	Meaning
P-1	e2e	
	p2p	
	disable	

85.2.12 ptp v2-boundary-clock network-protocol

Configure the network-protocol

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock network-protocol <P-1>

Parameter	Value	Meaning
P-1	ieee802.3	
	udp-ipv4	

85.2.13 ptp v2-boundary-clock vlan-priority

VLAN priority of tagged ptp packets.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock vlan-priority <P-1>

Parameter	Value	Meaning
P-1	0..7	

85.2.14 ptp v2-boundary-clock vlan

VLAN in which PTP packets are send. With a value of none all packets are send untagged.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ptp v2-boundary-clock vlan <P-1>

Parameter	Value	Meaning
P-1	vlanId	Send ptp to vlanId Use 0 for priority only tagged frames
	none	Send all ptp packets untagged

85.3 show

Display device options and settings.

85.3.1 show ptp

Display the PTP parameters and status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ptp [global] [v2-boundary-clock] [v2-transparent-clock] [port] [v2-transparent-clock] [v2-boundary-clock]

[global]: Display the PTP global status.

[v2-boundary-clock]: Display the PTP Boundary Clock status.

[v2-transparent-clock]: Display the PTP Transparent Clock status.

[port]: Display the PTP port values.

[v2-transparent-clock]: Display the PTP Transparent Clock port values.

[v2-boundary-clock]: Display the PTP Boundary Clock port values.

86 Password Management

86.1 passwords

Manage password policies and options.

86.1.1 passwords min-length

Set minimum password length for user passwords.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords min-length <P-1>

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.

86.1.2 passwords max-login-attempts

Set maximum login attempts for the users.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords max-login-attempts <P-1>

Parameter	Value	Meaning
P-1	0..5	Enter a number in the given range.

86.1.3 passwords min-uppercase-chars

Set minimum upper case characters for user passwords.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords min-uppercase-chars <P-1>

Parameter	Value	Meaning
P-1	0..16	Enter a number in the given range.

86.1.4 passwords min-lowercase-chars

Set minimum lower case characters for user passwords.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords min-lowercase-chars <P-1>

Parameter	Value	Meaning
P-1	0..16	Enter a number in the given range.

86.1.5 passwords min-numeric-chars

Set minimum numeric characters for user passwords.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords min-numeric-chars <P-1>

Parameter	Value	Meaning
P-1	0..16	Enter a number in the given range.

86.1.6 passwords min-special-chars

Set minimum special characters for user passwords.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords min-special-chars <P-1>

Parameter	Value	Meaning
P-1	0..16	Enter a number in the given range.

86.1.7 passwords login-attempt-period

The time period [minutes] in which the number of failed authentication attempts is counted. Value 0 disables this functionality.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: passwords login-attempt-period <P-1>

Parameter	Value	Meaning
P-1	<0>	Disables the counting.
	<1..60>	Enter a number in the given range.

86.2 show

Display device options and settings.

86.2.1 show passwords

Display the password policies and options.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show passwords

87 Radius

87.1 authorization

Configure authorization parameters.

87.1.1 authorization network radius

Enable or disable the switch to accept VLAN assignment by the RADIUS server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: authorization network radius

■ no authorization network radius

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no authorization network radius

87.2 radius

Configure RADIUS parameters.

87.2.1 radius accounting mode

Enable or disable RADIUS accounting function.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: radius accounting mode

■ no radius accounting mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no radius accounting mode

87.2.2 radius server attribute 4

Specifies the RADIUS client to use the NAS-IP Address attribute in the RADIUS requests.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: radius server attribute 4 <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

87.2.3 radius server acct add

Add a RADIUS accounting server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: radius server acct add <P-1> ip <P-2> [name <P-3>] [port <P-4>]

ip: RADIUS accounting server IP address.

[name]: RADIUS accounting server name.

[port]: RADIUS accounting server port (default: 1813).

Parameter	Value	Meaning
P-1	1..8	Next RADIUS server valid index (it can be seen with '#show radius global' command).
P-2	A.B.C.D	IP address.
P-3	string	Enter a user-defined text, max. 32 characters.
P-4	1..65535	Enter port number between 1 and 65535

87.2.4 radius server acct delete

Delete a RADIUS accounting server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server acct delete <P-1>

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.2.5 radius server acct modify

Change a RADIUS accounting server parameters.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server acct modify <P-1> [name <P-2>] [port <P-3>] [status <P-4>] [secret [<P-5>]] [encrypted <P-6>]

[name]: RADIUS accounting server name.

[port]: RADIUS accounting server port (default: 1813).

[status]: Enable or disable a RADIUS accounting server entry.

[secret]: Configure the shared secret for the RADIUS accounting server.

[encrypted]: Configure the encrypted shared secret.

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.
P-2	string	Enter a user-defined text, max. 32 characters.
P-3	1..65535	Enter port number between 1 and 65535
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	string	Enter a user-defined text, max. 128 characters.
P-6	string	Enter a user-defined text, max. 128 characters.

87.2.6 radius server auth add

Add a RADIUS authentication server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server auth add <P-1> ip <P-2> [name <P-3>] [port <P-4>]

ip: RADIUS authentication server IP address.

[name]: RADIUS authentication server name.

[port]: RADIUS authentication server port (default: 1812).

Parameter	Value	Meaning
P-1	1..8	Next RADIUS server valid index (it can be seen with '#show radius global' command).
P-2	A.B.C.D	IP address.
P-3	string	Enter a user-defined text, max. 32 characters.
P-4	1..65535	Enter port number between 1 and 65535

87.2.7 radius server auth delete

Delete a RADIUS authentication server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server auth delete <P-1>

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.2.8 radius server auth modify

Change a RADIUS authentication server parameters.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server auth modify <P-1> [name <P-2>] [port <P-3>] [msgauth <P-4>] [primary <P-5>] [status <P-6>] [secret [<P-7>]] [encrypted <P-8>]

[name]: RADIUS authentication server name.

[port]: RADIUS authentication server port (default: 1812).

[msgauth]: Enable or disable the message authenticator attribute for this server.

[primary]: Configure the primary RADIUS server.

[status]: Enable or disable a RADIUS authentication server entry.

[secret]: Configure the shared secret for the RADIUS authentication server.

[encrypted]: Configure the encrypted shared secret.

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.
P-2	string	Enter a user-defined text, max. 32 characters.
P-3	1..65535	Enter port number between 1 and 65535
P-4	enable	Enable the option.
	disable	Disable the option.
P-5	enable	Enable the option.
	disable	Disable the option.
P-6	enable	Enable the option.
	disable	Disable the option.
P-7	string	Enter a user-defined text, max. 128 characters.
P-8	string	Enter a user-defined text, max. 128 characters.

87.2.9 radius server retransmit

Configure the retransmit value for the RADIUS server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server retransmit <P-1>

Parameter	Value	Meaning
P-1	1..15	Maximum number of retransmissions (default: 4).

87.2.10 radius server timeout

Configure the RADIUS server timeout value.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server timeout <P-1>

Parameter	Value	Meaning
P-1	1..30	Timeout in seconds (default: 5).

87.2.11 radius source-interface

Configure the RADIUS client source interface (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius source-interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

87.3 show

Display device options and settings.

87.3.1 show radius global

Display the global RADIUS configuration.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show radius global

87.3.2 show radius auth servers

Display the configured RADIUS authentication servers.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show radius auth servers [<P-1>]

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.3.3 show radius auth statistics

Display the RADIUS authentication server statistics.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show radius auth statistics <P-1>

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.3.4 show radius acct statistics

Display the RADIUS accounting server statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show radius acct statistics <P-1>

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.3.5 show radius acct servers

Display the configured RADIUS accounting servers.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show radius acct servers [<P-1>]

Parameter	Value	Meaning
P-1	1..8	RADIUS server index.

87.4 clear

Clear several items.

87.4.1 clear radius

Clear the RADIUS statistics.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: clear radius <P-1>

Parameter	Value	Meaning
P-1	statistics	Clear the RADIUS statistics.

88 Redundant Coupling Protocol (RCP)

88.1 redundant-coupling

Set RCP parameters.

88.1.1 redundant-coupling operation

This command enables/disables the RCP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling operation
- no redundant-coupling operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no redundant-coupling operation

88.1.2 redundant-coupling timeout

Set RCP timeout in milliseconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling timeout <P-1>

Parameter	Value	Meaning
P-1	5..60000	Enter a number in the given range.

88.1.3 redundant-coupling role

Set the desired role of the current device inside the RCP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling role <P-1>

Parameter	Value	Meaning
P-1	master	Set this device as master RCP device.
	slave	Set this device as slave RCP device.
	single	Set this device as single RCP device.
	auto	Let the RCP decide the role of this device.

88.1.4 redundant-coupling port primary inner

Set a port as primary ring inner port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling port primary inner <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

88.1.5 redundant-coupling port primary outer

Set a port as primary ring outer port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling port primary outer <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

88.1.6 redundant-coupling port secondary inner

Set a port as secondary ring inner port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling port secondary inner <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

88.1.7 redundant-coupling port secondary outer

Set a port as secondary ring outer port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: redundant-coupling port secondary outer <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

88.2 show

Display device options and settings.

88.2.1 show redundant-coupling global

Display the global configuration of the RCP.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show redundant-coupling global

88.2.2 show redundant-coupling status

Display the status of the RCP.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show redundant-coupling status

88.2.3 show redundant-coupling partner

Display the information about the coupling partner device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show redundant-coupling partner

89 Remote Authentication

89.1 ldap

Configure LDAP settings.

89.1.1 ldap operation

Enable or disable the remote authentication operation.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap operation
- no ldap operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ldap operation

89.1.2 ldap cache-timeout

Configure LDAP user cache entry timeout.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap cache-timeout <P-1>

Parameter	Value	Meaning
P-1	1..1440	Enter a number in the given range.

89.1.3 ldap flush-user-cache

Flush LDAP user cache.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap flush-user-cache <P-1>

Parameter	Value	Meaning
P-1	action	Flush the LDAP user cache.

89.1.4 ldap role-policy

Configure LDAP user role selection policy.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap role-policy <P-1>

Parameter	Value	Meaning
P-1	highest	Use the role mapping with the highest user role.
	first	Use the first matching role mapping table entry.

89.1.5 ldap basedn

Base distinguished name for LDAP query at the external AD server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap basedn <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

89.1.6 ldap search-attr

Search attribute for LDAP query at the external AD server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap search-attr <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

89.1.7 ldap bind-user

Bind-account user name for LDAP query at the external AD server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap bind-user <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

89.1.8 ldap bind-passwd

Bind-account user password for LDAP query at the external AD server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap bind-passwd <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

89.1.9 ldap default-domain

Default domain used for users without a domain name.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap default-domain <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

89.1.10 ldap client server add

Add a LDAP client server connection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap client server add <P-1> <P-2> [port <P-3>] [security <P-4>]
[description <P-5>]

[port]: Set the port number of the external LDAP server.

[security]: Set the security settings for the connection to external LDAP server.

[description]: Description of the external LDAP server.

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.
P-2	A.B.C.D	IP address.
P-3	1..65535	Port number of LDAP Server.
P-4	none ssl startTLS	
P-5	string	Enter a user-defined text, max. 100 characters.

89.1.11 ldap client server delete

Delete a LDAP client server connection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap client server delete <P-1>

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

89.1.12 ldap client server enable

Enable a LDAP client server connection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap client server enable <P-1>

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

89.1.13 ldap client server disable

Disable a LDAP client server connection.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ldap client server disable <P-1>

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

89.1.14 ldap client server modify

Modify a LDAP client server connection.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap client server modify <P-1> [addr <P-2>] [port <P-3>] [security <P-4>] [description <P-5>]

[addr]: Modify the host address of the external LDAP server.

[port]: Modify the port number of the external LDAP server.

[security]: Modify the security settings for the connection to external LDAP server.

[description]: Modify the description of the external LDAP server.

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.
P-2	A.B.C.D	IP address.
P-3	1..65535	Port number of LDAP Server.
P-4	none	
	ssl	
	startTLS	
P-5	string	Enter a user-defined text, max. 100 characters.

89.1.15 ldap mapping add

Add a LDAP mapping entry.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap mapping add <P-1> access-role <P-2> mapping-type <P-3> mapping-parameter <P-4>

access-role: Access role type.

mapping-type: Role mapping type.

mapping-parameter: Role mapping parameter.

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.
P-2	slot no./port no.	
P-3	attribute	
	group	
P-4	string	Enter a user-defined text, max. 255 characters.

89.1.16 ldap mapping delete

Delete a LDAP role mapping entry.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap mapping delete <P-1>

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.

89.1.17 ldap mapping enable

Activate a LDAP role mapping entry.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap mapping enable <P-1>

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.

89.1.18 ldap mapping disable

Deactivate a LDAP role mapping entry.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap mapping disable <P-1>

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.

89.2 show

Display device options and settings.

89.2.1 show ldap global

Display the LDAP configuration parameters and information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show ldap global

89.2.2 show ldap client server

Display the LDAP client server connections.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show ldap client server [<P-1>]

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

89.2.3 show ldap mapping

Display the LDAP role mapping entries.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show ldap mapping [<P-1>]

Parameter	Value	Meaning
P-1	1..64	Enter a number in the given range.

89.3 copy

Copy different kinds of items.

89.3.1 copy ldapcert remote

Copy CA certificate file (*.pem) from the remote AD server to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy ldapcert remote <P-1> nvm [<P-2>] [source-interface <P-3>]

nvm: Copy CA certificate file (*.pem) from the remote AD server to the device.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.
P-3	slot no./port no.	

89.3.2 copy ldapcert envm

Copy CA certificate file (*.pem) from external non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy ldapcert envm <P-1> nvm [<P-2>]

nvm: Copy CA certificate file (*.pem) from external non-volatile memory to the device.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	string	Enter a user-defined text, max. 100 characters.

90 Remote Monitoring (RMON)

90.1 rmon-alarm

Create a RMON alarm action.

90.1.1 rmon-alarm add

Add RMON alarm.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: rmon-alarm add <P-1> [mib-variable <P-2>] [rising-threshold <P-3>] [falling-threshold <P-4>]

[mib-variable]: MIB variable

[rising-threshold]: Rising threshold

[falling-threshold]: Falling threshold

Parameter	Value	Meaning
P-1	1..150	Enter an index that uniquely identifies an entry in the alarm table.
P-2	string	Enter an object identifier of the particular variable to be sampled, max. 32 characters.
P-3	1..2147483647	Enter the rising threshold for the sampled statistic.
P-4	1..2147483647	Enter the falling threshold for the sampled statistic.

90.1.2 rmon-alarm enable

Enable RMON alarm.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: rmon-alarm enable <P-1>

Parameter	Value	Meaning
P-1	1..150	Enter an index that uniquely identifies an entry in the alarm table.

90.1.3 rmon-alarm disable

Disable RMON alarm.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: rmon-alarm disable <P-1>

Parameter	Value	Meaning
P-1	1..150	Enter an index that uniquely identifies an entry in the alarm table.

90.1.4 rmon-alarm delete

Delete RMON alarm.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: rmon-alarm delete <P-1>

Parameter	Value	Meaning
P-1	1..150	Enter an index that uniquely identifies an entry in the alarm table.

90.1.5 rmon-alarm modify

Modify RMON alarm parameters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: rmon-alarm modify <P-1> [mib-variable <P-2>] [rising-threshold <P-3>] [falling-threshold <P-4>] [interval <P-5>] [sample-type <P-6>] [startup-alarm <P-7>] [rising-event <P-8>] [falling-event <P-9>]

[mib-variable]: Enter the alarm MIB variable.

[rising-threshold]: Enter the alarm rising threshold.

[falling-threshold]: Enter the alarm falling-threshold.

[interval]: Enter the alarm interval in seconds over which the data is sampled.

[sample-type]: Enter the alarm method of sampling the selected variable.

[startup-alarm]: Enter the alarm type.

[rising-event]: Enter the alarm rising-event index.

[falling-event]: Enter the alarm falling-event index.

Parameter	Value	Meaning
P-1	1..150	Enter an index that uniquely identifies an entry in the alarm table.
P-2	string	Enter an object identifier of the particular variable to be sampled, max. 32 characters.
P-3	1..2147483647	Enter the rising threshold for the sampled statistic.
P-4	1..2147483647	Enter the falling threshold for the sampled statistic.
P-5	1..2147483647	Enter the interval in seconds over which the data is sampled and compared with the rising and falling thresholds.
P-6	absoluteValue	Variable is compared directly with the thresholds.
	deltaValue	Variable is subtracted from the current value and the difference compared with the thresholds.
P-7	risingAlarm	Single rising alarm generated when the sample is greater than or equal to the rising threshold.
	fallingAlarm	Single falling alarm generated when the sample is less than or equal to the falling threshold.
	risingOrFallingAlarm	Single Rising alarm generated when the sample is greater than or equal to rising threshold and single falling alarm generated when the sample is less than or equal to falling threshold.
P-8	1..65535	Enter the index of the event entry that is used when a rising threshold is crossed.
P-9	1..65535	Enter the index of the event entry that is used when a falling threshold is crossed.

90.2 show

Display device options and settings.

90.2.1 show rmon statistics

Display the RMON statistics configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show rmon statistics [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

90.2.2 show rmon alarm

Display the configuration on RMON alarms.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show rmon alarm

91 Script File

91.1 script

CLI Script File.

91.1.1 script apply

Executes the CLI script file available in the device.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: script apply <P-1>

Parameter	Value	Meaning
P-1	string	Filename.

91.1.2 script validate

Only validates the CLI script file available in the device.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: script validate <P-1>

Parameter	Value	Meaning
P-1	string	Filename.

91.1.3 script list system

List all the script files available in the device memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: script list system

91.1.4 script list envm

List all the script files available in external non-volatile memory.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: script list envm

91.1.5 script delete

Delete the CLI script files.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: script delete [<P-1>]

Parameter	Value	Meaning
P-1	string	Filename.

91.2 copy

Copy different kinds of items.

91.2.1 copy script envm

Copy script file from external non-volatile memory to specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy script envm <P-1> running-config nvm <P-2>
running-config: Copy script file from external non-volatile memory to the running-config.
nvm: Copy script file from external non-volatile memory to the non-volatile memory.

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	Enter a user-defined text, max. 32 characters.

91.2.2 copy script remote

Copy script file from server to specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy script remote <P-1> running-config [source-interface <P-2>] nvm <P-3> [source-interface <P-4>]

running-config: Copy script file from file server to running-config.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

nvm: Copy script file to non-volatile memory.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	
P-3	string	Enter a user-defined text, max. 32 characters.
P-4	slot no./port no.	

91.2.3 copy script nvm

Copy Script file from non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy script nvm <P-1> running-config envm <P-2> remote <P-3> [source-interface <P-4>]

running-config: Copy Script file from non-volatile system memory to running-config.

envm: Copy Script file to external non-volatile memory device.

remote: Copy Script file to file server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Filename.
P-2	string	Enter a user-defined text, max. 32 characters.
P-3	string	Enter a user-defined text, max. 128 characters.
P-4	slot no./port no.	

91.2.4 copy script running-config nvm

Copy running configuration to non-volatile memory.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: copy script running-config nvm <P-1> [all]
- [all]: Copy all running configuration to non-volatile memory.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

91.2.5 copy script running-config envm

Copy running configuration to external non-volatile memory device.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: copy script running-config envm <P-1> [all]
- [all]: Copy all running configuration to external non-volatile memory.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 32 characters.

91.2.6 copy script running-config remote

Copy running configuration to a file server.

- ▶ Mode: Privileged Exec Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: copy script running-config remote <P-1> [all] [source-interface <P-2>]
- [all]: Copy all running configuration to file server.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

Parameter	Value	Meaning
P-2	slot no./port no.	

91.3 show

Display device options and settings.

91.3.1 show script envm

Display the content of the CLI script file present in the envm.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show script envm <P-1>

Parameter	Value	Meaning
P-1	string	Filename.

91.3.2 show script system

Display the content of the CLI script file present in the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show script system <P-1>

Parameter	Value	Meaning
P-1	string	Filename.

92 Selftest

92.1 selftest

Configure the selftest settings.

92.1.1 selftest action

Configure the action that a selftest component should take.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: selftest action <P-1> <P-2>

Parameter	Value	Meaning
P-1	task	Configure the action for task errors.
	resource	Configure the action for lack of resources.
	software	Configure the action for broken software integrity.
	hardware	Configure the action for detected hardware errors.
P-2	log-only	Write a message to the logging file.
	send-trap	Send a trap to the management station.
	reboot	Reboot the device.

92.1.2 selftest ramtest

Enable or disable the RAM selftest on cold start of the device. When disabled the device booting time is reduced.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: selftest ramtest

■ no selftest ramtest

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no selftest ramtest

92.1.3 selftest system-monitor

Enable or disable the System Monitor 1 access during the boot phase. Please note: If the System Monitor is disabled it is possible to loose access to the device permanently in case of loosing administrator password or mis-configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: selftest system-monitor

■ no selftest system-monitor

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no selftest system-monitor

92.1.4 selftest boot-default-on-error

Enable or disable loading of the default configuration in case there is any error loading the configuration during boot phase. If disabled the system will be halted.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: selftest boot-default-on-error

■ no selftest boot-default-on-error

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no selftest boot-default-on-error

92.1.5 selftest push-button

Enable or disable the push button functionality on the device.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: selftest push-button
-
- no selftest push-button
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no selftest push-button

92.2 show

Display device options and settings.

92.2.1 show selftest action

Display the actions the device takes if an error occurs.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show selftest action

92.2.2 show selftest settings

Display the selftest settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show selftest settings

93 sFlow

93.1 sflow

Configure sFlow

93.1.1 sflow receiver

Configure sflow receiver.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: sflow receiver <P-1> owner <P-2> [ip <P-3>] [timeout <P-4>] timeout <P-5> maxdatagram <P-6> ip <P-7> port <P-8>

owner: Configure sflow owner.

[ip]: Configure sflow receiver IP address.

[timeout]: Configure sflow receiver timeout.

timeout: Configure sflow receiver timeout.

maxdatagram: Configure sflow maximum size of the receiver datagram.

ip: Configure sflow receiver IP address.

port: Configure sflow receiver port.

Parameter	Value	Meaning
P-1	1..8	Enter a sFlow receiver index.
P-2	string	Enter receiver owner string, max. 127 characters.
P-3	A.B.C.D	IP address.
P-4	-1..2147483647	Enter timeout: -1:no timeout, 0:reset configuration, 1 - 2147483647. Note: timeout setting will not be saved.
P-5	-1..2147483647	Enter timeout: -1:no timeout, 0:reset configuration, 1 - 2147483647. Note: timeout setting will not be saved.
P-6	200..3996	Enter maximum datagram size between 200 and 3996.
P-7	A.B.C.D	IP address.
P-8	1..65535	Enter port number between 1 and 65535

93.2 sflow

Configure sflow sampler and poller.

93.2.1 sflow poller receiver

Set a receiver for this poller.

- Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: sflow poller receiver <P-1> [interval <P-2>]
- [interval]: Set an interval for this poller.

Parameter	Value	Meaning
P-1	0..8	Enter a sFlow receiver index, 0 to reset configuration.
P-2	0..86400	Enter poller interval between 0 and 86400. Enter 0 to disable the poller.

93.2.2 sflow poller interval

Set an interval for this poller.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: sflow poller interval <P-1>

Parameter	Value	Meaning
P-1	0..86400	Enter poller interval between 0 and 86400. Enter 0 to disable the poller.

93.2.3 sflow sampler receiver

Set a receiver for this sampler.

- Mode: Interface Range Mode
 - Privilege Level: Operator
 - Format: sflow sampler receiver <P-1> [rate <P-2>]
- [rate]: Configure sflow sampler rate.

Parameter	Value	Meaning
P-1	0..8	Enter a sFlow receiver index, 0 to reset configuration.
P-2	0	Disable sampling
	256-65536	Set sampling rate. The device changes the value to the closest value that the device hardware supports.

93.2.4 sflow sampler rate

Configure sflow sampler rate.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: sflow sampler rate <P-1>

Parameter	Value	Meaning
P-1	0	Disable sampling
	256-65536	Set sampling rate. The device changes the value to the closest value that the device hardware supports.

93.2.5 sflow sampler maxheadersize

Configure sflow sampler maximum header size.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: sflow sampler maxheadersize <P-1>

Parameter	Value	Meaning
P-1	20..256	Enter maximum header size between 20 and 256

93.3 show

Display device options and settings.

93.3.1 show sflow agent

Display the sflow agent settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sflow agent

93.3.2 show sflow receivers

Display the sflow receiver settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sflow receivers [<P-1>]

Parameter	Value	Meaning
P-1	1..8	Enter a sFlow receiver index.

93.3.3 show sflow pollers

Display the sflow poller settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sflow pollers

93.3.4 show sflow samplers

Display the sflow sampler settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sflow samplers

94 Small Form-factor Pluggable (SFP)

94.1 show

Display device options and settings.

94.1.1 show sfp

Display the information about the plugged SFP modules.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: `show sfp [<P-1>]`

Parameter	Value	Meaning
P-1	slot no./port no.	

95 Signal Contact

95.1 signal-contact

Configure the signal contact settings.

95.1.1 signal-contact mode

Configure the Signal Contact mode setting.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> mode <P-2>

Parameter	Value	Meaning
P-1	signal contact no.	
P-2	manual	The signal contact's status is determined by the associated manual setting (subcommand 'state').
	monitor	The signal contact's status is determined by the associated monitor settings.
	device-status	The signal contact's status is determined by the device status.
	security-status	The signal contact's status is determined by the security status.
	dev-sec-status	The signal contact's status is determined by the device status and security status.

95.1.2 signal-contact monitor link-failure

Sets the monitoring of the network connection(s).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor link-failure

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor link-failure
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor link-failure

95.1.3 signal-contact monitor module-removal

Sets the monitoring of the module removal.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor module-removal

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor module-removal
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor module-removal

95.1.4 signal-contact monitor fan-failure

Sets the monitoring of the fan module failure.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor fan-failure

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor fan-failure
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor fan-failure

95.1.5 signal-contact monitor envm-not-in-sync

Sets the monitoring whether the external non-volatile memory device is in sync with the running configuration.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor envm-not-in-sync

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor envm-not-in-sync
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor envm-not-in-sync

95.1.6 signal-contact monitor envm-removal

Sets the monitoring of the external non-volatile memory device removal.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor envm-removal

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor envm-removal
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor envm-removal

95.1.7 signal-contact monitor temperature

Sets the monitoring of the device temperature.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor temperature

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor temperature
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor temperature

95.1.8 signal-contact monitor ring-redundancy

Sets the monitoring of the ring-redundancy.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor ring-redundancy

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact monitor ring-redundancy
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> monitor ring-redundancy

95.1.9 signal-contact monitor power-supply

Sets the monitoring of the power supply(s).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor power-supply <P-2>

Parameter	Value	Meaning
P-1	signal contact no.	
P-2	1..2	Number of power supply.

■ no signal-contact monitor power-supply

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no signal-contact <P-1> monitor power-supply <P-2>

95.1.10 signal-contact monitor ethernet-loops

Sets the monitoring for Ethernet loops.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor ethernet-loops

Parameter	Value	Meaning
P-1	signal contact no.	

■ no signal-contact monitor ethernet-loops

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no signal-contact <P-1> monitor ethernet-loops

95.1.11 signal-contact monitor humidity

Sets the monitoring of the device humidity.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor humidity

Parameter	Value	Meaning
P-1	signal contact no.	

■ no signal-contact monitor humidity

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no signal-contact <P-1> monitor humidity

95.1.12 signal-contact monitor stp-blocking

Sets the monitoring of ports blocked by STP.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> monitor stp-blocking

Parameter	Value	Meaning
P-1	signal contact no.	

■ no signal-contact monitor stp-blocking

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no signal-contact <P-1> monitor stp-blocking

95.1.13 signal-contact state

Configure the Signal Contact manual state (only takes immediate effect in manual mode).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> state <P-2>

Parameter	Value	Meaning
P-1	signal contact no.	
P-2	open	Open the signal contact (only takes effect in the manual mode).
	close	Close the signal contact (only takes effect in the manual mode).

95.1.14 signal-contact trap

Configure if a trap is sent when the Signal Contact changes state (in monitor mode).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> trap

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact trap
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> trap

95.1.15 signal-contact module

Configure the monitoring of the specific module.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> module <P-2>

Parameter	Value	Meaning
P-1	signal contact no.	
P-2	slot no./port no.	

- no signal-contact module
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> module <P-2>

95.1.16 signal-contact fan-module

Configure the monitoring of the specific fan module.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> fan-module <P-2>

Parameter	Value	Meaning
P-1	signal contact no.	
P-2	1..1	Number of fan modules.

- no signal-contact fan-module
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> fan-module <P-2>

95.2 signal-contact

Configure the signal contact interface settings.

95.2.1 signal-contact link-alarm

Configure the monitoring of the specific network ports.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Administrator
- ▶ Format: signal-contact <P-1> link-alarm

Parameter	Value	Meaning
P-1	signal contact no.	

- no signal-contact link-alarm
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no signal-contact <P-1> link-alarm

95.3 show

Display device options and settings.

95.3.1 show signal-contact

Display the signal contact settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show signal-contact <P-1> mode monitor state trap link-alarm module fan-module events all

mode: Display the signal contact mode.

monitor: Display the signal contact monitor settings.

state: Display the signal contact state (open/close). Note: This covers the signal contact's administrative setting as well as its actual state.

trap: Display the signal contact trap information and settings.

link-alarm: Display the settings of the monitoring of the specific network ports.

module: Display the settings of the monitoring of the specific modules.

fan-module: Display the settings of the monitoring of the specific fan modules.

events: Display the occurred device status events.

all: Display the signal contact settings for the specified signal contact.

Parameter	Value	Meaning
P-1	signal contact no.	

96 Signed Firmware

96.1 firmware

Configure firmware parameters.

96.1.1 firmware allow-unsigned

Allow to upload unsigned device software.

- ▶ **Mode:** Global Config Mode
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** firmware allow-unsigned <P-1>

Parameter	Value	Meaning
P-1	enable	Enable the option.
	disable	Disable the option.

96.2 show

Display device options and settings.

96.2.1 show firmware allow-unsigned

Display allow unsigned firmware upgrade preferences.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show firmware allow-unsigned

96.2.2 show firmware ca-cert

Display the information of the firmware signing certificates.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show firmware ca-cert

97 Slot

97.1 slot

Configure module status.

97.1.1 slot operation

Enable or disable slot

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: slot <P-1> operation

Parameter	Value	Meaning
P-1	slot no./port no.	

- no slot operation
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no slot <P-1> operation

97.1.2 slot module

Remove a virtual module

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: slot <P-1> module <P-2>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	remove-virtual	Remove a virtual module

97.2 show

Display device options and settings.

97.2.1 show slot

Display the module parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show slot [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

98 Switched Monitoring (SMON)

98.1 monitor

Configure port mirroring.

98.1.1 monitor session

Configure port mirroring.

► **Mode:** Global Config Mode

► **Privilege Level:** Operator

► **Format:** monitor session <P-1> destination interface <P-2> [secondary-interface <P-3>] remote vlan <P-4> source interface <P-5> direction <P-6> operation vlan <P-7> remote vlan <P-8> mode allow-mgmt

destination: Configure the probe interface.

interface: Configure interface.

[secondary-interface]: Configure secondary interface.

remote: Destination RSPAN configuration.

vlan: Set the destination RSPAN VLAN used to tag the mirrored frames.

source: Configure the source interface.

interface: Configure interface

direction: Select interface.

operation: Enable/disable mirroring on an interface.

vlan: Set the VLAN to mirror.

remote: Source RSPAN configuration.

vlan: Set the source RSPAN VLAN on which mirrored frames are expected.

mode: Enable/Disable port mirroring session. Note: does not affect the source or destination interfaces.

allow-mgmt: Enable/Disable port responsiveness while mirroring. Note: does not affect the source interfaces.

Parameter	Value	Meaning
P-1	1	Monitor session index.
P-2	slot no./port no.	
P-3	slot no./port no.	
P-4	integer	VLAN Mirror Remote VLAN ID List.
P-5	slot no./port no.	
P-6	none	None.
	tx	Packets that are transmitted on the source interfaces are copied to the destination interface.
	rx	Packets that are received on the source interfaces are copied to the destination interface.
	txrx	Packets that are transmitted or received on the source interfaces are copied to the destination interface.
P-7	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.
P-8	integer	VLAN Mirror Remote VLAN ID List.

■ no monitor session

Disable the option

► **Mode:** Global Config Mode

► **Privilege Level:** Operator

► **Format:** no monitor session <P-1> destination interface [secondary-interface] remote vlan source interface <P-5> direction operation vlan remote vlan mode allow-mgmt

98.2 rspan-vlan

98.2.1 rspan-vlan

Set the VLAN used by RSPAN. The VLAN must already be created.

► **Mode:** VLAN Database Mode

► **Privilege Level:** Operator

► **Format:** rspan-vlan <P-1>

Parameter	Value	Meaning
P-1	integer	VLAN Mirror Remote VLAN ID List.

98.3 show

Display device options and settings.

98.3.1 show monitor session

Display port monitor session settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show monitor session <P-1>

Parameter	Value	Meaning
P-1	1	Monitor session index.

98.4 clear

Clear several items.

98.4.1 clear monitor session

Delete configuration for this session.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: clear monitor session <P-1>

Parameter	Value	Meaning
P-1	1	Monitor session index.

99 Simple Network Management Protocol (SNMP)

99.1 snmp

Configure of SNMP versions and traps.

99.1.1 snmp access version v1

Enable or disable SNMP version V1.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp access version v1
- no snmp access version v1
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no snmp access version v1

99.1.2 snmp access version v2

Enable or disable SNMP version V2.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp access version v2
- no snmp access version v2
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no snmp access version v2

99.1.3 snmp access version v3

Enable or disable SNMP version V3.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp access version v3
- no snmp access version v3
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no snmp access version v3

99.1.4 snmp access port

Configure the SNMP access port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp access port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of the SNMP server (default: 161).

99.1.5 snmp access snmp-over-802

Configure SNMPover802.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp access snmp-over-802

- no snmp access snmp-over-802
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no snmp access snmp-over-802

99.1.6 snmp notification user add

Add SNMPv3 notification user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp notification user add <p-1> <p-2> [auth <p-3> <p-4>] [priv <p-5> <p-6>]

Parameter	Value	Meaning
P-1	name	User name (1 to 32 characters).
P-2	auth-no-priv	Authentication no privacy.
	auth-priv	Authentication and privacy.
	no-auth	No authentication, no privacy.
P-3	md5	MD5 as SNMPv3 notification user authentication mode.
	sha1	SHA1 as SNMPv3 notification user authentication mode.
P-4	passphrase	Passphrase (8 to 64 characters).
P-5	des	DES as SNMPv3 notification privacy method.
	aes	AES as SNMPv3 notification privacy method.
P-6	passphrase	Passphrase (8 to 64 characters).

99.1.7 snmp notification user delete

Delete SNMPv3 notification user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp notification user delete <p-1>

Parameter	Value	Meaning
P-1	name	User name (1 to 32 characters).

99.1.8 snmp notification host add

Add SNMPv3 notification host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp notification host add <p-1> <p-2> user <p-3> <p-4><p-5>

Parameter	Value	Meaning
P-1	name	User name (1 to 32 characters).
P-2	a.b.c.d	Single IPv4 address.
	a.b.c.d:n	IPv4 address with port.
	[a:b:c:d:e:f:g:h]	Single IPv6 address.
	[a:b:c:d:e:f:g:h]:n	IPv6 address with port.
P-3	name	User name (1 to 32 characters).
P-4	auth-no-priv	Authentication no privacy.
	auth-priv	Authentication and privacy.
	no-auth	No authentication, no privacy.

99.1.9 snmp notification host delete

Delete SNMPv3 notification host.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp notification host delete <p-1>

Parameter	Value	Meaning
P-1	name	User name (1 to 32 characters).

99.2 show

Display device options and settings.

99.2.1 show snmp access

Display the SNMP access configuration settings.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show snmp access

99.2.2 show snmp notification users

Display the SNMP v3 notification user configuration.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show snmp notification users

99.2.3 show snmp notification hosts

Display the SNMP v3 trap host configuration.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show snmp notification hosts

100SNMP Community

100.1 snmp

Configure of SNMP versions and traps.

100.1.1 snmp community ro

SNMP v1/v2 read-only community.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp community ro <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

100.1.2 snmp community rw

SNMP v1/v2 read-write community.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp community rw <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 64 characters.

100.2 show

Display device options and settings.

100.2.1 show snmp community

Display the SNMP v1/2 community.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Administrator
- ▶ Format: show snmp community

101SNMP Logging

101.1 logging

Logging configuration.

101.1.1 logging snmp-request get operation

Enable or disable logging of SNMP GET or SET requests.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging snmp-request get operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable logging of SNMP GET or SET requests.
	disable	Disable logging of SNMP GET or SET requests.

■ no logging snmp-request get operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no logging snmp-request get operation <P-1>

101.1.2 logging snmp-request get severity

Define severity level.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging snmp-request get severity <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

101.1.3 logging snmp-request set operation

Enable or disable logging of SNMP GET or SET requests.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging snmp-request set operation <P-1>

Parameter	Value	Meaning
P-1	enable	Enable logging of SNMP GET or SET requests.
	disable	Disable logging of SNMP GET or SET requests.

■ no logging snmp-request set operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no logging snmp-request set operation <P-1>

101.1.4 logging snmp-request set severity

Define severity level.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: logging snmp-request set severity <P-1>

Parameter	Value	Meaning
P-1	emergency	System is unusable. System failure has been detected.
	alert	Take immediate action. Potential unrecoverable failure of a component. Potential system failure.
	critical	Recoverable failure of a component has been detected and may lead to potential system failure.
	error	Error conditions detected. Potential failure of a component recoverable.
	warning	Minor failure, e.g. misconfiguration of a component.
	notice	Normal but significant conditions.
	informational	Informational messages.
	debug	Debug-level messages.
	0	Same as emergency
	1	Same as alert
	2	Same as critical
	3	Same as error
	4	Same as warning
	5	Same as notice
	6	Same as informational
	7	Same as debug

101.2 show

Display device options and settings.

101.2.1 show logging snmp

Display the SNMP logging settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show logging snmp

102Simple Network Time Protocol (SNTP)

102.1 sntp

Configure SNTP settings.

102.1.1 sntp client operation

Enable or disable the SNTP client

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client operation

■ no sntp client operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp client operation

102.1.2 sntp client operating-mode

Set the operating mode of the SNTP client. In unicast-mode, the client sends a request to the SNTP Server. In broadcast-mode, the client waits for a broadcast message from the SNTP Server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client operating-mode <P-1>

Parameter	Value	Meaning
P-1	unicast	Set the operating mode to unicast.
	broadcast	Set the operating mode to broadcast.

102.1.3 sntp client request-interval

Set the SNTP client request interval in seconds. The request-interval is only used in the operating-mode unicast.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client request-interval <P-1>

Parameter	Value	Meaning
P-1	5..3600	Enter a number in the given range.

102.1.4 sntp client broadcast-rcv-timeout

Set the SNTP client broadcast receive timeout in seconds. The broadcast receive timeout is only used in the operating-mode broadcast.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client broadcast-rcv-timeout <P-1>

Parameter	Value	Meaning
P-1	128..2048	Enter a number in the given range.

102.1.5 sntp client disable-after-sync

If this option is activated, the SNTP client disables itself once it is synchronized to a SNTP server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client disable-after-sync

■ no sntp client disable-after-sync

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp client disable-after-sync

102.1.6 sntp client interface

Change the SNTP client so that it sends packets with the source IP of the selected interface

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

102.1.7 sntp client server add

Add a SNTP client server connection

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: sntp client server add <P-1> <P-2> [port <P-3>] [description <P-4>]
- [port]: Set the port number of the external time server.
[description]: Description of the external time server

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.
P-2	A.B.C.D	IP address.
P-3	1..65535	Port number of SNTP Server (default 123).
P-4	string	Enter a user-defined text, max. 32 characters.

102.1.8 sntp client server delete

delete a SNTP client server connection

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client server delete <P-1>

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

102.1.9 sntp client server mode

Enable or disable a SNTP client server connection

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp client server mode <P-1>

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

■ no sntp client server mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp client server mode <P-1>

102.1.10 sntp server operation

Enable or disable the SNTP server

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server operation

■ no sntp server operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp server operation

102.1.11 sntp server interface

Change the SNTP server so that it sends packets with the source IP of the selected interface

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server interface <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

102.1.12sntp server port

Set the local socket port number used to listen for client requests.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of SNTP Server (default 123).

102.1.13sntp server only-if-synchronized

Set the disabling of the SNTP server function, if it is not synchronized to another external time reference

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server only-if-synchronized

■ no sntp server only-if-synchronized

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp server only-if-synchronized

102.1.14sntp server broadcast operation

Enable or disable the SNTP server broadcast mode

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server broadcast operation

■ no sntp server broadcast operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no sntp server broadcast operation

102.1.15sntp server broadcast address

Set the SNTP server's broadcast or multicast IP address (default: 0.0.0.0 (none)).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server broadcast address <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

102.1.16sntp server broadcast port

Set the destination socket port number used to send broadcast or multicast messages to the client.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server broadcast port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of SNTP Server (default 123).

102.1.17sntp server broadcast interval

Set the SNTP server's interval in seconds for sending broadcast or multicast messages.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server broadcast interval <P-1>

Parameter	Value	Meaning
P-1	64..1024	Enter a number in the given range.

102.1.18sntp server broadcast vlan

Set the SNTP server's broadcast VLAN ID used for sending broadcast or multicast messages.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: sntp server broadcast vlan <P-1>

Parameter	Value	Meaning
P-1	0..4042	Enter the VLAN ID. Entering of ID 0 uses the management VLAN ID.

102.2 show

Display device options and settings.

102.2.1 show sntp global

Display the SNTP configuration parameters and information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sntp global

102.2.2 show sntp client status

Display the SNTP client status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sntp client status

102.2.3 show sntp client server

Display the SNTP client server connections.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sntp client server [<P-1>]

Parameter	Value	Meaning
P-1	1..4	Enter a number in the given range.

102.2.4 show sntp server status

Display the SNTP server configuration parameters and information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sntp server status

102.2.5 show sntp server broadcast

Display the SNTP server broadcast configuration parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show sntp server broadcast

103Spanning Tree

103.1 spanning-tree

Enable or disable the Spanning Tree protocol.

103.1.1 spanning-tree drstp trap-mode

Enable or disable STP traps on this device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp trap-mode

■ no spanning-tree drstp trap-mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree drstp trap-mode

103.1.2 spanning-tree drstp bpdu-filter

Enable or disable the BPDU filter on the edge ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp bpdu-filter

■ no spanning-tree drstp bpdu-filter

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree drstp bpdu-filter

103.1.3 spanning-tree drstp bpdu-guard

Enable or disable the BPDU guard on the edge ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp bpdu-guard

■ no spanning-tree drstp bpdu-guard

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree drstp bpdu-guard

103.1.4 spanning-tree drstp forward-time

Set the Bridge Forward Delay parameter [s].

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp forward-time <P-1>

Parameter	Value	Meaning
P-1	4..30	Enter the bridge forward delay as an integer.

103.1.5 spanning-tree drstp hello-time

Set the Hello Time parameter [s].

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp hello-time <P-1>

Parameter	Value	Meaning
P-1	1..2	Set the Hello Time parameter (unit: seconds).

103.1.6 spanning-tree drstp hold-count

Set the bridge hold count parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp hold-count <P-1>

Parameter	Value	Meaning
P-1	1..40	Set bridge hold count parameter.

103.1.7 spanning-tree drstp max-age

Set the bridge Max Age parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp max-age <P-1>

Parameter	Value	Meaning
P-1	6..40	Set the bridge Max Age parameter.

103.1.8 spanning-tree drstp max-hops

Set the bridge Max Hops parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp max-hops <P-1>

Parameter	Value	Meaning
P-1	6..40	Set the bridge Max Hops parameter.

103.1.9 spanning-tree drstp mst priority

Specify the bridge priority used by a MST instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp mst priority <P-1> <P-2>

Parameter	Value	Meaning
P-1	0..0	Enter the multiple spanning tree ID 0 (0 is for CIST and RSTP).
P-2	0..61440	Set the Mst Bridge priority.

103.1.10 spanning-tree drstp ring-only-mode operation

Enable or disable the RSTP Ring Only Mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp ring-only-mode operation

■ no spanning-tree drstp ring-only-mode operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree drstp ring-only-mode operation

103.1.11 spanning-tree drstp ring-only-mode first-port

Configure the first ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp ring-only-mode first-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

103.1.12 spanning-tree drstp ring-only-mode second-port

Configure the second ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree drstp ring-only-mode second-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

103.1.13spanning-tree operation

Enable or disable the function.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree operation

■ no spanning-tree operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree operation

103.1.14spanning-tree trap-mode

Enable or disable STP traps on this device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree trap-mode

■ no spanning-tree trap-mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree trap-mode

103.1.15spanning-tree bpdu-filter

Enable or disable the BPDU filter on the edge ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree bpdu-filter

■ no spanning-tree bpdu-filter

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree bpdu-filter

103.1.16spanning-tree bpdu-guard

Enable or disable the BPDU guard on the edge ports.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree bpdu-guard

■ no spanning-tree bpdu-guard

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree bpdu-guard

103.1.17spanning-tree bpdu-migration-check

Force the specified port to transmit RST or MST BPDUs.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree bpdu-migration-check <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

103.1.18spanning-tree forceversion

Set the force protocol version parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree forceversion <P-1>

Parameter	Value	Meaning
P-1	stp	Spanning Tree Protocol (STP).
	rstp	Rapid Spanning Tree Protocol (RSTP).
	mstp	Multiple Spanning Tree Protocol (MSTP).

103.1.19spanning-tree forward-time

Set the Bridge Forward Delay parameter [s].

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree forward-time <P-1>

Parameter	Value	Meaning
P-1	4..30	Enter the bridge forward delay as an integer.

103.1.20spanning-tree hello-time

Set the Hello Time parameter [s].

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree hello-time <P-1>

Parameter	Value	Meaning
P-1	1..2	Set the Hello Time parameter (unit: seconds).

103.1.21spanning-tree hold-count

Set the bridge hold count parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree hold-count <P-1>

Parameter	Value	Meaning
P-1	1..40	Set bridge hold count parameter.

103.1.22spanning-tree max-age

Set the bridge Max Age parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree max-age <P-1>

Parameter	Value	Meaning
P-1	6..40	Set the bridge Max Age parameter.

103.1.23spanning-tree ring-only-mode operation

Enable or disable the RSTP Ring Only Mode.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree ring-only-mode operation

■ no spanning-tree ring-only-mode operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree ring-only-mode operation

103.1.24spanning-tree ring-only-mode first-port

Configure the first ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree ring-only-mode first-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

103.1.25spanning-tree ring-only-mode second-port

Configure the second ring port.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree ring-only-mode second-port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

103.1.26spanning-tree max-hops

Set the bridge Max Hops parameter.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree max-hops <P-1>

Parameter	Value	Meaning
P-1	6..40	Set the bridge Max Hops parameter.

103.1.27spanning-tree mst priority

This command is left for compatibility issues with scripting. Please use 'instance modify 0 priority' command to set the bridge priority for CIST.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree mst priority <P-1> <P-2>

Parameter	Value	Meaning
P-1	0..0	Enter the multiple spanning tree ID 0 (0 is for CIST and RSTP).
P-2	0..61440	Set the Mst Bridge priority.

103.1.28spanning-tree mst instance add

Create a MST instance

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree mst instance add <P-1> [priority <P-2>]
[priority]: Specify the bridge priority used by a MST instance.

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.
P-2	0..61440	Set the Mst Bridge priority.

103.1.29spanning-tree mst instance delete

Destroy a MST instance

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree mst instance delete <P-1>

Parameter	Value	Meaning
P-1	1..4094	Enter a multiple spanning tree ID.

103.1.30spanning-tree mst instance modify

Modify a MST instance

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree mst instance modify <P-1> priority <P-2> vlan add <P-3> delete <P-4>

priority: Specify the bridge priority used by a MST instance.

vlan: Add or remove a VLAN from a MST instance.

add: Add a VLAN to MST instance.

delete: Delete a VLAN from an MST instance.

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.
P-2	0..61440	Set the Mst Bridge priority.
P-3	1..4042	Select the MST bridge VLAN.
P-4	1..4042	Select the MST bridge VLAN.

103.1.31spanning-tree configuration name

Set the MST configuration name.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree configuration name <P-1>

Parameter	Value	Meaning
P-1	string	<name> Enter a valid name for the configuration.

103.1.32spanning-tree configuration revision

Set the MST configuration identifier revision level.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree configuration revision <P-1>

Parameter	Value	Meaning
P-1	0..65535	Enter a revision number between 0 and 65535.

103.2 spanning-tree

Enable or disable the Spanning Tree protocol on a port.

103.2.1 spanning-tree mode

Enable or disable the function.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: spanning-tree mode
- no spanning-tree mode
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no spanning-tree mode

103.2.2 spanning-tree bpdu-flood

Enable or disable BPDU flooding on a port.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: spanning-tree bpdu-flood
- no spanning-tree bpdu-flood
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no spanning-tree bpdu-flood

103.2.3 spanning-tree bpdu-filter

Enable or disable BPDU filter on a port.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: spanning-tree bpdu-filter
- no spanning-tree bpdu-filter
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no spanning-tree bpdu-filter

103.2.4 spanning-tree edge-auto

Enable or disable auto edge detection on a port.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: spanning-tree edge-auto
- no spanning-tree edge-auto
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no spanning-tree edge-auto

103.2.5 spanning-tree edge-port

Enable or disable edge port usage on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree edge-port

■ no spanning-tree edge-port

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree edge-port

103.2.6 spanning-tree guard-loop

Enable or disable the loop guard on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree guard-loop

■ no spanning-tree guard-loop

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree guard-loop

103.2.7 spanning-tree guard-root

Enable or disable the root guard on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree guard-root

■ no spanning-tree guard-root

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree guard-root

103.2.8 spanning-tree guard-tcn

Enable or disable the TCN guard on a port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree guard-tcn

■ no spanning-tree guard-tcn

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no spanning-tree guard-tcn

103.2.9 spanning-tree cost

Specify the port path cost for STP, RSTP and CIST.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree cost <P-1>

Parameter	Value	Meaning
P-1	0..200000000	Specify the port path cost.

103.2.10 spanning-tree priority

Specify the port priority for STP, RSTP and CIST.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: spanning-tree priority <P-1>

Parameter	Value	Meaning
P-1	0..240	Specify the port priority.

103.2.11 spanning-tree mst

MST instance related configuration.

► Mode: Interface Range Mode

► Privilege Level: Operator

► Format: spanning-tree mst <P-1> cost <P-2> priority <P-3>

cost: Specify the port path cost.

priority: Specify the port priority.

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.
P-2	0-200000000	Set the cost value. The value of 0 has the same effect as auto.
	auto	Set the pathcost value automatically on the basis of Link Speed.
P-3	0..240	Specify the port priority.

103.3 show

Display device options and settings.

103.3.1 show spanning-tree global

Display the Common and Internal Spanning Tree information and settings.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show spanning-tree global

103.3.2 show spanning-tree drstp

Display the second instance Common and Internal Spanning Tree information and settings.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show spanning-tree drstp

103.3.3 show spanning-tree mst instance

Display summarized information and settings for all ports in an MST instance.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show spanning-tree mst instance [<P-1>]

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.

103.3.4 show spanning-tree mst port

Display summarized information and settings for all ports in an MST instance.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show spanning-tree mst port [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.
P-2	slot no./port no.	

103.3.5 show spanning-tree mst vlan

Display summarized information and settings for all ports in an MST instance.

► Mode: Command is in all modes available.

► Privilege Level: Guest

► Format: show spanning-tree mst vlan [<P-1> [<P-2>]]

Parameter	Value	Meaning
P-1	0..4094	Enter a multiple spanning tree ID.
P-2	1..4042	Select the MST bridge VLAN.

103.3.6 show spanning-tree port

Spanning Tree information and settings for an interface.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show spanning-tree port <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

104Subring Management

104.1 sub-ring

Sub-ring manager operations.

104.1.1 sub-ring operation

Enable or disable the global sub-ring manager functionality on this device.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: sub-ring operation
- no sub-ring operation
- Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no sub-ring operation

104.1.2 sub-ring add

Creates a new sub-ring domain with the value id.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: sub-ring add <P-1> [mode <P-2>] [vlan <P-3>] [port <P-4>] [name <P-5>] [mrp-domain <P-6>]

[mode]: Set operating mode for the sub-ring domain with the value id.

[vlan]: Set vlan id for the sub-ring domain with the value id.

[port]: Set the port for the sub-ring domain with the value id.

[name]: Set name for the sub-ring domain with the value id.

[mrp-domain]: MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.
P-2	manager	The entity takes on the role of a Sub-Ring Manager.
	redundant-manager	The entity takes on the role of the Sub-Ring Manager and blocks the ring port if the sub-ring is closed.
	single-manager	The single-manager has both ends of a sub-ring connected to its ports and blocks one of these ends if the sub-ring is closed.
P-3	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.
P-4	slot no./port no.	
P-5	string	Enter a user-defined text, max. 255 characters.
P-6	string	<domain id> MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

104.1.3 sub-ring delete

Deletes the subring domain with the value id.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: sub-ring delete <P-1>

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.

104.1.4 sub-ring enable

Enable the sub-ring domain with the value id.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: sub-ring enable <P-1>

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.

104.1.5 sub-ring disable

Disable the sub-ring domain with the value id.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: sub-ring disable <P-1>

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.

104.1.6 sub-ring modify

Modify parameters of the sub-ring domain with the value id.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: sub-ring modify <P-1> [mode <P-2>] [vlan <P-3>] [port <P-4>] [name <P-5>] [mrp-domain <P-6>]

[mode]: Set operating mode for the sub-ring domain with the value id.

[vlan]: Set vlan id for the sub-ring domain with the value id.

[port]: Set the port for the sub-ring domain with the value id.

[name]: Set name for the sub-ring domain with the value id.

[mrp-domain]: MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.
P-2	manager	The entity takes on the role of a Sub-Ring Manager.
	redundant-manager	The entity takes on the role of the Sub-Ring Manager and blocks the ring port if the sub-ring is closed.
	single-manager	The single-manager has both ends of a sub-ring connected to its ports and blocks one of these ends if the sub-ring is closed.
P-3	0..4042	Enter the VLAN ID. Entering of ID 0 disables the feature.
P-4	slot no./port no.	
P-5	string	Enter a user-defined text, max. 255 characters.
P-6	string	<domain id> MRP domain ID. Format: 16 bytes in decimal notation. (Example: 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16).

104.2 show

Display device options and settings.

104.2.1 show sub-ring global

Display the Sub-ring global parameters.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show sub-ring global

104.2.2 show sub-ring ring

Display the Sub-ring detailed parameters.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show sub-ring ring [<P-1>]

Parameter	Value	Meaning
P-1	1..40000	SRM Domain Id.

105Secure Shell (SSH)

105.1 ssh

Set SSH parameters.

105.1.1 ssh server

Enable or disable the SSH server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh server
- no ssh server
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no ssh server

105.1.2 ssh timeout

Set the SSH connection idle timeout in minutes (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh timeout <P-1>

Parameter	Value	Meaning
P-1	0..160	Idle timeout of a session in minutes (default: 5).

105.1.3 ssh port

Set the SSH server port number (default: 22).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Port number of the SSH server (default: 22).

105.1.4 ssh max-sessions

Set the maximum number of concurrent SSH sessions (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh max-sessions <P-1>

Parameter	Value	Meaning
P-1	1..5	Maximum number of concurrent SSH sessions.

105.1.5 ssh outbound max-sessions

Set the maximum number of concurrent outbound SSH sessions (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh outbound max-sessions <P-1>

Parameter	Value	Meaning
P-1	1..5	Maximum number of concurrent SSH sessions.

105.1.6 ssh outbound timeout

Set the SSH connection idle timeout in minutes (default: 5).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh outbound timeout <P-1>

Parameter	Value	Meaning
P-1	0..160	Idle timeout of a session in minutes (default: 5).

105.1.7 ssh key rsa

Generate or delete RSA key

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh key rsa <P-1>

Parameter	Value	Meaning
P-1	generate	Generates the item
	delete	Deletes the item

105.1.8 ssh key fingerprint-type

Configure fingerprint type

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: ssh key fingerprint-type <P-1>

Parameter	Value	Meaning
P-1	md5	Configure md5 fingerprint of the existing SSH host key
	sha256	Configure sha256 fingerprint of the existing SSH host key.

105.2 ssh

105.2.1 ssh

Establish an SSH connection to a remote host.

- ▶ Mode: "User Mode" and "Privileged Exec Mode"
- ▶ Privilege Level: Guest
- ▶ Format: ssh <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	1..65535	Enter port number between 1 and 65535

105.3 copy

Copy different kinds of items.

105.3.1 copy sshkey remote

Copy the SSH key from a server to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy sshkey remote <P-1> nvm [source-interface <P-2>]

nvm: Copy the SSH key from a server to non-volatile memory.

[source-interface]: Specify the source-interface to be used (physical or logical). The frames will not necessarily be sent on this interface, only the IP address of the interface will be used as source IP.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.
P-2	slot no./port no.	

105.3.2 copy sshkey envm

Copy the SSH key from external non-volatile memory to the specified destination.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Administrator
- ▶ Format: copy sshkey envm <P-1> nvm

nvm: Copy the SSH key from external non-volatile memory to non-volatile memory.

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 128 characters.

105.4 show

Display device options and settings.

105.4.1 show ssh

Display the SSH server and client information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** `show ssh`

106Storm Control

106.1 storm-control

Configure the global storm-control settings.

106.1.1 storm-control flow-control

Enable or disable flow control globally.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: storm-control flow-control
- no storm-control flow-control
- Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no storm-control flow-control

106.2 traffic-shape

Traffic shape commands.

106.2.1 traffic-shape bw

Set threshold value

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: traffic-shape bw <P-1>

Parameter	Value	Meaning
P-1	0..100	Enter a number in the given range.

106.3 mtu

106.3.1 mtu

Set the MTU size (without VLAN tag size, because the VLAN tag is ignored for size calculation).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mtu <P-1>

Parameter	Value	Meaning
P-1	1518..12288	Enter a number in the given range.

106.4 mtu

106.4.1 mtu

Set the MTU size (without VLAN tag size, because the VLAN tag is ignored for size calculation).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mtu <P-1>

Parameter	Value	Meaning
P-1	1518..1530	Enter a number in the given range.

106.5 mtu

106.5.1 mtu

Set the MTU size (without VLAN tag size, because the VLAN tag is ignored for size calculation).

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: mtu <P-1>

Parameter	Value	Meaning
P-1	1518..12288	Enter a number in the given range.

106.6 storm-control

Storm control commands

106.6.1 storm-control flow-control

Enable or disable flow control (802.3x) for this port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control flow-control

■ no storm-control flow-control

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no storm-control flow-control

106.6.2 storm-control ingress unit

Set unit.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress unit <P-1>

Parameter	Value	Meaning
P-1	percent	Metering unit expressed in percentage of bandwidth.
	pps	Metering unit expressed in packets per second.

106.6.3 storm-control ingress threshold

Set threshold value. The rate limiter function calculates the threshold based on data packets sized 512 bytes. When the unit is set to pps, the maximum value is 24414 for 100Mb/s and 244140 for 1000Mb/s.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.6.4 storm-control ingress unicast operation

Enable/disable ingress storm control for unicast frames with unknown destination.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress unicast operation

■ no storm-control ingress unicast operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no storm-control ingress unicast operation

106.6.5 storm-control ingress unicast threshold

Set the threshold value for unicast frames with unknown destination.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress unicast threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.6.6 storm-control ingress unknown-frames operation

Enable/disable ingress storm control for frames with unknown destination.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: storm-control ingress unknown-frames operation
- no storm-control ingress unknown-frames operation
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no storm-control ingress unknown-frames operation

106.6.7 storm-control ingress unknown-frames threshold

Set the threshold value for frames with unknown destination.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress unknown-frames threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.6.8 storm-control ingress multicast operation

Enable/disable ingress storm control for multicast frames.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: storm-control ingress multicast operation
- no storm-control ingress multicast operation
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no storm-control ingress multicast operation

106.6.9 storm-control ingress multicast threshold

Set the threshold value for multicast frames.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress multicast threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.6.10 storm-control ingress multicast threshold

Set the threshold for multicast frames with known destination.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress multicast threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.6.11 storm-control ingress broadcast operation

Enable/disable ingress storm control for broadcast frames.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress broadcast operation

■ no storm-control ingress broadcast operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no storm-control ingress broadcast operation

106.6.12 storm-control ingress broadcast threshold

Set the threshold value for broadcast frames.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: storm-control ingress broadcast threshold <P-1>

Parameter	Value	Meaning
P-1	0..14880000	Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.

106.7 show

Display device options and settings.

106.7.1 show storm-control flow-control

Global flow control status.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show storm-control flow-control

106.7.2 show storm-control ingress

Display the storm control ingress parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show storm-control ingress [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

106.7.3 show traffic-shape

Display the traffic shape parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show traffic-shape

106.7.4 show mtu

Display the MTU parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show mtu

107System

107.1 system

Set system related values e.g. name of the device, location of the device, contact data for the person responsible for the device, and pre-login banner text.

107.1.1 system name

Edit the name of the device. The system name consists of an alphanumeric ASCII character string with 0..255 characters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: system name <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

107.1.2 system location

Edit the location of the device. The system location consists of an alphanumeric ASCII character string with 0..255 characters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: system location <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

107.1.3 system contact

Edit the contact information for the person responsible for the device. The contact data consists of an alphanumeric ASCII character string with 0..255 characters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: system contact <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 255 characters.

107.1.4 system port-led-mode

Configure the port led signalling (frontpanel or servicepanel).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: system port-led-mode <P-1>

Parameter	Value	Meaning
P-1	portpanel	Set LED control to portpanel.
	servicepanel	Set LED control to servicepanel.

107.1.5 system pre-login-banner operation

Enable or disable the pre-login banner. You use the pre-login banner to display a greeting or information to users before they login to the device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: system pre-login-banner operation

■ no system pre-login-banner operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no system pre-login-banner operation

107.1.6 system pre-login-banner text

Edit the text for the pre-login banner (C printf format syntax allowed: \n\t) The device allows you to edit an alphanumeric ASCII character string with up to 512 characters.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: system pre-login-banner text <P-1>

Parameter	Value	Meaning
P-1	string	Enter a user-defined text, max. 512 characters (allowed characters are from ASCII 32 to 127).

107.1.7 system resources operation

Enable or disable the measurement operation.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: system resources operation

■ no system resources operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no system resources operation

107.2 temperature

Configure the upper and lower temperature limits of the device. The device allows you to set the threshold as an integer from -99 through 99. You configure the temperatures in degrees Celsius.

107.2.1 temperature upper-limit

Configure the upper temperature limit.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: temperature upper-limit <P-1>

Parameter	Value	Meaning
P-1	-99..99	Upper temperature threshold ([C], default 70).

107.2.2 temperature lower-limit

Configure the lower temperature limit.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: temperature lower-limit <P-1>

Parameter	Value	Meaning
P-1	-99..99	Lower temperature threshold ([C], default 0).

107.3 humidity

Configure the upper and lower humidity limits of the device. The device allows you to set the threshold as an integer from 0 through 100.

107.3.1 humidity upper-limit

Configure the upper humidity limit.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: humidity upper-limit <P-1>

Parameter	Value	Meaning
P-1	0..100	Upper humidity threshold ([%], default 95%).

107.3.2 humidity lower-limit

Configure the lower humidity limit.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: humidity lower-limit <P-1>

Parameter	Value	Meaning
P-1	0..100	Lower humidity threshold ([%], default 5).

107.4 hardware

The Hardware LAN bypass feature ensures that traffic passes freely between interface pairs when system is fully up and is running an Operating System or when system is in a shutdown state

107.4.1 hardware runtime-bypass

Enable or disable Run-time hardware LAN bypass.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: hardware runtime-bypass
- no hardware runtime-bypass
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no hardware runtime-bypass

107.4.2 hardware systemoff-bypass

Enable or disable System-off hardware LAN bypass.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: hardware systemoff-bypass
- no hardware systemoff-bypass
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no hardware systemoff-bypass

107.5 show

Display device options and settings.

107.5.1 show eventlog

Display the event log notice and warning entries with time stamp.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show eventlog

107.5.2 show system info

Display the system related information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system info

107.5.3 show system port-led-mode

Display the LED control settings.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system port-led-mode

107.5.4 show system pre-login-banner

Display the pre-login banner status and text.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system pre-login-banner

107.5.5 show system flash-status

Display the flash memory statistics of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system flash-status

107.5.6 show system temperature limits

Display the temperature limits.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system temperature limits

107.5.7 show system temperature extremes

Display the minimum and maximum recorded temperature.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system temperature extremes

107.5.8 show system temperature histogram

Display the temperature histogram of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system temperature histogram

107.5.9 show system temperature counters

Display number of 20 centigrade C variations in maximum one hour period.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system temperature counters

107.5.10 show system humidity limits

Display the humidity limits.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system humidity limits

107.5.11 show system humidity extremes

Display the minimum and maximum recorded humidity.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system humidity extremes

107.5.12 show system humidity histogram

Display the humidity histogram of the device.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show system humidity histogram

107.5.13show system resources

Display the system resources information (CPU utilization, memory and network CPU utilization).

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show system resources

107.5.14show psu slot

Display the power supply slots.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show psu slot

107.5.15show psu unit

Display the information for the power supply units.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show psu unit

107.5.16show fan

Display the information for the fan modules.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show fan

107.5.17show hardware runtime-bypass

Display runtime-bypass state of hardware bypass.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show hardware runtime-bypass

107.5.18show hardware systemoff-bypass

Display systemoff-bypass state of hardware bypass.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show hardware systemoff-bypass

108Telnet

108.1 telnet

Set Telnet parameters.

108.1.1 telnet server

Enable or disable the telnet server.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: telnet server
-
- no telnet server
 - Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Administrator
 - ▶ Format: no telnet server

108.1.2 telnet timeout

Set the idle timeout for a telnet connection in minutes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: telnet timeout <P-1>

Parameter	Value	Meaning
P-1	0..160	Idle timeout of a session in minutes (default: 5).

108.1.3 telnet port

Set the listening port for the telnet server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: telnet port <P-1>

Parameter	Value	Meaning
P-1	1..65535	Set the listening port for the telnet server.

108.1.4 telnet max-sessions

Set the maximum number of sessions for the telnet server.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: telnet max-sessions <P-1>

Parameter	Value	Meaning
P-1	1..5	Set the maximum number of connections for the telnet server.

108.2 telnet

108.2.1 telnet

Establish a telnet connection to a remote host.

- ▶ Mode: "User Mode" and "Privileged Exec Mode"
- ▶ Privilege Level: Guest
- ▶ Format: telnet <P-1> [<P-2>] [<P-3>] [<P-4>] [<P-5>]

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..65535	Enter port number between 1 and 65535
P-3	debug	Display the current Telnet options.
P-4	line	Set the outbound Telnet operational mode as line mode (only takes effect for the serial connection).
P-5	echo	Enable local echo (only takes effect for the serial connection).

108.3 show

Display device options and settings.

108.3.1 show telnet

Display the telnet server information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Guest
- ▶ **Format:** show telnet

109Time Range

109.1 time

Create or delete time range.

109.1.1 time range

Create or delete time range.

► Mode: Global Config Mode

► Privilege Level: Operator

► Format: time range <P-1> [absolute] [start <P-2> <P-3> <P-4> <P-5>] [end <P-6> <P-7> <P-8> <P-9>] [periodic <P-10> <P-11>] to [<P-12>] <P-13>

[absolute]: Create or delete absolute time entry.

[start]: Set start time and date.

[end]: Set end time and date.

[periodic]: Create or delete periodic time entry. It must not overlap with any other periodic entry defined for this time range.

to: Set end of periodic time entry.

Parameter	Value	Meaning
P-1	string	Enter the time range name, max. 31 characters.
P-2	hh:mm	Time of day, in 24-hour format.
P-3	1..31	Day of the month.
P-4	jan	January
	feb	February
	mar	March
	apr	April
	may	May
	jun	June
	jul	July
	aug	August
	sep	September
	oct	October
	nov	November
	dec	December
P-5	1993..2035	Year.
P-6	hh:mm	Time of day, in 24-hour format.
P-7	1..31	Day of the month.
P-8	jan	January
	feb	February
	mar	March
	apr	April
	may	May
	jun	June
	jul	July
	aug	August
	sep	September
	oct	October
	nov	November
	dec	December
P-9	1993..2035	Year.
P-10	sunday	Sunday
	monday	Monday
	tuesday	Tuesday
	wednesday	Wednesday
	thursday	Thursday
	friday	Friday
	saturday	Saturday
	daily	Daily
	weekdays	Weekdays
	weekend	Weekend
	list of days	A comma-separated combination of days
P-11	hh:mm	Time of day, in 24-hour format.

Parameter	Value	Meaning
P-12	sunday	Sunday
	monday	Monday
	tuesday	Tuesday
	wednesday	Wednesday
	thursday	Thursday
	friday	Friday
	saturday	Saturday
P-13	hh:mm	Time of day, in 24-hour format.

- no time range
 - Disable the option
 - Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: no time range <P-1> [absolute] [start] [end] [periodic] to [<P-12>] <P-13>

109.2 show

Display device options and settings.

109.2.1 show time-range

Display the time range and its time entries.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show time-range [<P-1>]

Parameter	Value	Meaning
P-1	string	Enter the time range name, max. 31 characters.

110Tracking

110.1 track

Configure tracking instances on the device.

110.1.1 track add

Create a tracking instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: track add <P-1> <P-2>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.

110.1.2 track delete

Delete a tracking instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: track delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.

110.1.3 track enable

Activate a tracking instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: track enable <P-1> <P-2>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.

110.1.4 track disable

Deactivate a tracking instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: track disable <P-1> <P-2>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.

110.1.5 track trap

Enable / Disable the StateChange trap for the corresponding tracking instance.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: track trap <P-1> <P-2>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.

- no track trap
Disable the option
 - Mode: Global Config Mode
 - Privilege Level: Operator
 - Format: no track trap <P-1> <P-2>

110.1.6 track description

Set the description for the corresponding tracking instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track description <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	interface	interface tracking
	ping	ping tracking
	logical	logical tracking
P-2	1..256	Enter a number in the given range.
P-3	string	Enter a user-defined text, max. 255 characters.

110.1.7 track modify interface

Modify the configuration of an interface tracking instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track modify interface <P-1> [interface <P-2>] [linkup-delay <P-3>]
[linkdown-delay <P-4>]

[interface]: Set the interface number of the interface tracking instance.

[linkup-delay]: Set the linkup-delay of the interface tracking instance

[linkdown-delay]: Set the linkdown-delay of the interface tracking instance

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	slot no./port no.	
P-3	0..255	Enter a number in the given range.
P-4	0..255	Enter a number in the given range.

110.1.8 track modify ping

Modify the configuration of a ping tracking instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track modify ping <P-1> [interface <P-2>] [address <P-3>] [interval <P-4>]
[miss <P-5>] [success <P-6>] [timeout <P-7>] [ttl <P-8>]

[interface]: Set the source interface number of the ping tracking instance.

[address]: Set the address of the router to be monitored.

[interval]: Set the number of milliseconds between the pings to the target router address.

[miss]: Set the number of consecutive ping misses until the tracked object is considered to be down.

[success]: Set the of consecutive ping successes until the tracked object is considered to be up.

[timeout]: Set the timeout in milliseconds for a ping reply.

[ttl]: Set the time to live for a ping request packet.

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	slot no./port no.	
P-3	A.B.C.D	IP address.
P-4	100..20000	value for ping tracking interval that could be between 100 and 20000.
P-5	1..10	value for ping tracking that could be between 1 and 10.
P-6	1..10	value for ping tracking that could be between 1 and 10.
P-7	10..10000	value for ping tracking time that could be between 10 and 10000.
P-8	1..255	Enter a number in the given range.

110.1.9 track modify logical

Modify the configuration of a logical tracking instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track modify logical <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	slot no./port no.	
P-2	string	Track instance.

Parameter	Value	Meaning
P-3	and	AND operator
	or	OR operator
P-4	string	Track instance.

110.2 show

Display device options and settings.

110.2.1 show track overview

Display the information and settings for the tracking instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show track overview

110.2.2 show track interface

Display the information and settings for the interface tracking instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show track interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

110.2.3 show track ping

Display the information and settings for the ping tracking instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show track ping [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

110.2.4 show track logical

Display the information and settings for the logical tracking instances.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show track logical [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

110.2.5 show track application

Display the information on tracking application registrations.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show track application

111Traps

111.1 snmp

Configure of SNMP versions and traps.

111.1.1 snmp trap operation

Global enable/disable SNMP trap.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp trap operation

■ no snmp trap operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no snmp trap operation

111.1.2 snmp trap mode

Enable/disable SNMP trap entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp trap mode <P-1>

Parameter	Value	Meaning
P-1	string	<name> Trap name (1 to 32 characters)

■ no snmp trap mode

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: no snmp trap mode <P-1>

111.1.3 snmp trap delete

Delete SNMP trap entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp trap delete <P-1>

Parameter	Value	Meaning
P-1	string	<name> Trap name (1 to 32 characters)

111.1.4 snmp trap add

Add SNMP trap entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: snmp trap add <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<name> Trap name (1 to 32 characters)
P-2	a.b.c.d	a.b.c.d Single IPv4 address.
	a.b.c.d:n	a.b.c.d:n IPv4 address with port.
	[a:b:c:d:e:f:g:h]	[a:b:c:d:e:f:g:h] Single IPv6 address.
	[a:b:c:d:e:f:g:h]:n	[a:b:c:d:e:f:g:h]:n IPv6 address with port.

111.2 show

Display device options and settings.

111.2.1 show snmp traps

Display the SNMP traps.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show snmp traps

112Time Sensitive Networks (TSN)

112.1 tsn

Configure TSN (Time Sensitive Network) settings.

112.1.1 tsn operation

Enable or disable TSN.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn operation

■ no tsn operation

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no tsn operation

112.1.2 tsn base-time

Configure the base-time.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn base-time <P-1>

Parameter	Value	Meaning
P-1	time	Enter the base time in the given format YYYY-MM-DD,hh:mm:ss.ns.

112.1.3 tsn cycle-time

Configure the cycle-time in nanoseconds.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn cycle-time <P-1>

Parameter	Value	Meaning
P-1	50000..10000000	Enter the cycle time in nanoseconds.

112.2 tsn

Configure TSN (Time Sensitive Network) settings for interfaces.

112.2.1 tsn sdu traffic-class

Specify the traffic class for the SDU.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn sdu traffic-class <P-1> max-sdu <P-2>

max-sdu: Enter the maximum size of the SDU (service data unit). A value of 0 is interpreted as the maximum SDU size supported by the underlying MAC. The SDU includes the packet payload but excludes the source and destination MAC addresses (6 bytes each), the VLAN tag (4 bytes) and the FCS (4 bytes). Example for a 64 bytes Ethernet packet: 64 bytes - 12 bytes (MAC) - 4 bytes (VLAN) - 4 bytes (FCS) = 44 bytes (SDU).

Parameter	Value	Meaning
P-1	0..7	Enter the Traffic Class value.
P-2	integer	Enter the maximum size of the SDU (service data unit). A value of 0 is interpreted as the maximum SDU size supported by the underlying MAC. The SDU includes the packet payload but excludes the source and destination MAC addresses (6 bytes each), the VLAN tag (4 bytes) and the FCS (4 bytes). Example for a 64 bytes Ethernet packet: 64 bytes - 12 bytes (MAC) - 4 bytes (VLAN) - 4 bytes (FCS) = 44 bytes (SDU).

112.2.2 tsn gates operation

Enable or disable the GCL (gate control list) for TSN. If disabled the default gate states will apply.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn gates operation

■ no tsn gates operation

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no tsn gates operation

112.2.3 tsn commit

Commit the configured values to be active as current values. If the time gates set to enabled and the base time is in the past the cycle will be started. Otherwise the cycle start will be done when base time is reached.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn commit

112.2.4 tsn base-time

Configure the base-time.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn base-time <P-1>

Parameter	Value	Meaning
P-1	time	Enter the base time in the given format YYYY-MM-DD,hh:mm:ss.ns.

112.2.5 tsn default-gate-states

Configure the default gate states.They will be active in case of time gates will be disabled.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn default-gate-states <P-1>

Parameter	Value	Meaning
P-1	gate states	Enter gate state or gate states as comma separated values eg, 1,4,5.
	none	Reset gate states.

112.2.6 tsn cycle-time

Configure the cycle-time in nanoseconds.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: tsn cycle-time <P-1>

Parameter	Value	Meaning
P-1	1000..1000000000	Enter the cycle time in nanoseconds.

112.2.7 tsn gcl add

Create GCL entry.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: tsn gcl add [id <P-1>] [gate-states <P-2>] [interval <P-3>]
- [id]: Index of the GCL entry that shall be inserted.
[gate-states]: Set gate states of GCL entry.
[interval]: Set interval [ns] of GCL entry.

Parameter	Value	Meaning
P-1	1..150	GCL entry ID.
P-2	gate states	Enter gate state or gate states as comma separated values eg, 1,4,5.
	none	Reset gate states.
P-3	80..1000000000	Enter the interval in nanoseconds.

112.2.8 tsn gcl template

Choose one of the pre-defined templates for GCL.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: tsn gcl template <P-1>

Parameter	Value	Meaning
P-1	default-2-time-slots	Template with 3 entries. First entry is the traffic class 7. Second entry is the traffic class 6 to 0. Third entry is a guard band.
	default-3-time-slots	Template with 5 entries. First entry is the traffic class 7. Second entry is a guard band. Third entry is the traffic class 6. Fourth entry is the traffic class 5 to 0. Fifth entry is a guard band.
	gb-tc7-tc6to0	Template with 3 entries. First entry is a guard band. Second entry is the traffic class 7. Third entry is the traffic class 6 to 0.
	tc6to0-gb-tc7	Template with 3 entries. First entry is the traffic class 6 to 0. Second entry is a guard band. Third entry is the traffic class 7.
	gb-tc7-gb-tc6-tc5to0	Template with 5 entries. First entry is a guard band. Second entry is the traffic class 7. Third entry is a guard band. Fourth entry is the traffic class 6. Fifth entry is the traffic class 5 to 0.
	tc5to0-gb-tc7-gb-tc6	Template with 5 entries. First entry is the traffic class 5 to 0. Second entry is a guard band. Third entry is the traffic class 7. Fourth entry is a guard band. Fifth entry is the traffic class 6.
	gb-tc6-gb-tc7-tc5to0	Template with 5 entries. First entry is a guard band. Second entry is the traffic class 6. Third entry is a guard band. Fourth entry is the traffic class 7. Fifth entry is the traffic class 5 to 0.
	gb-tc7-tc5to0-gb-tc6	Template with 5 entries. First entry is a guard band. Second entry is the traffic class 7. Third entry is the traffic class 5 to 0. Fourth entry is a guard band. Fifth entry is the traffic class 6.

112.2.9 tsn gcl modify

Modify GCL entry.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: tsn gcl modify <P-1> <P-2> interval <P-3> <P-4> gate-states <P-5>

interval: Modify interval [ns] of GCL entry.

gate-states: Modify gate states of GCL entry.

Parameter	Value	Meaning
P-1	1..150	GCL entry ID.
P-2	1..5	GCL entry ID.
P-3	80..1000000000	Enter the interval in nanoseconds.
P-4	1000..100000000	Enter the interval in nanoseconds.
P-5	gate states	Enter gate state or gate states as comma separated values eg, 1,4,5.
	none	Reset gate states.

112.2.10 tsn gcl delete

Delete specified GCL entry.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: tsn gcl delete <P-1>

Parameter	Value	Meaning
P-1	1..150	GCL entry ID.
	all	Delete all GCL entries.

112.3 show

Display device options and settings.

112.3.1 show tsn global

Display the TSN global settings.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show tsn global

112.3.2 show tsn sdu

Display the SDU settings for each traffic class and port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show tsn sdu [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

112.3.3 show tsn gcl

Display the configured and current GCL (gate control list) for the port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show tsn gcl [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

112.3.4 show tsn configuration

Display the configured and current preferences for TSN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show tsn configuration

113TTDP

113.1 ttdp

Configure the ttdp settings.

113.1.1 ttdp operation

Enable/disable TTDP.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ttdp operation
- no ttdp operation
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ttdp operation

113.1.2 ttdp backbone-id

Set the backbone ID for this ETBN.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp backbone-id <P-1>

Parameter	Value	Meaning
P-1	a	Line a.
	b	Line b.
	c	Line c.
	d	Line d.

113.1.3 ttdp etbn inhibit

Enable/disable inhibit inauguration for this ETBN.

- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ttdp etbn inhibit
- no ttdp etbn inhibit
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ttdp etbn inhibit

113.1.4 ttdp etbn role

ETBN role(switch or router).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp etbn role <P-1>

Parameter	Value	Meaning
P-1	router	Router.
	switch	Switch.

- no ttdp etbn role
Disable the option
- ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ttdp etbn role

113.1.5 ttdp consist etbn-number

Set the number of ETBNs in this consist.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp consist etbn-number <P-1>

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.

113.1.6 ttdp consist cn-number

Set the number of CNs in this consist.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp consist cn-number <P-1>

Parameter	Value	Meaning
P-1	0..32	Enter a number in the given range.

113.1.7 ttdp consist local-etbn-number

Set the id of local ETBN in this consist.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp consist local-etbn-number <P-1>

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.

113.1.8 ttdp consist uuid

Set the UUID for this consist.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp consist uuid <P-1>

Parameter	Value	Meaning
P-1	yyyyyyxx-xxxx-xxxx-xxxx-yyyyyyyyyyyy	Enter UUID in hexadecimal format (size should be of 32 hexadecimal numbers).

113.1.9 ttdp consist cn-to-etbn etbn

Modify the ETBN with this ID.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ttdp consist cn-to-etbn etbn <P-1> add <P-2> [port <P-3>] [use-dhcp <P-4>] delete <P-5> modify <P-6> port <P-7> use-dhcp <P-8>

add: Add a CN to the specified ETBN.

[port]: Set the port for specified CN.

[use-dhcp]: Enable/disable the use of TTDP DHCP server.

delete: Delete a CN from the specified ETBN.

modify: Modify a CN from specified ETBN.

port: Set the port for specified CN.

use-dhcp: Enable/disable the use of TTDP DHCP server.

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.
P-2	1..32	Enter a number in the given range.
P-3	slot no./port no.	
P-4	True	True.
	False	False.
P-5	1..32	Enter a number in the given range.
P-6	1..32	Enter a number in the given range.
P-7	slot no./port no.	
P-8	True	True.
	False	False.

■ no ttdp consist cn-to-etbn etbn

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ttdp consist cn-to-etbn etbn add [port] [use-dhcp] delete modify port use-dhcp <P-8>

113.2 show

Display device options and settings.

113.2.1 show ttdp global

Display the TTDP global configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp global

113.2.2 show ttdp local-consist

Display the TTDP local consist configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp local-consist

113.2.3 show ttdp internal-info

Display the TTDP ETBN internal configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp internal-info

113.2.4 show ttdp local-etbn-info

Display the TTDP local ETBN configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp local-etbn-info

113.2.5 show ttdp networks

Display the configuration of the TTDP local consist CN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp networks

113.2.6 show ttdp consists-etbns

Display the configuration of the TTDP consist ETBN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp consists-etbns [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.
P-2	1..32	Enter a number in the given range.

113.2.7 show ttdp consists-cns

Display the configuration of the TTDP consist CN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp consists-cns [<P-1>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.

113.2.8 show ttdp consists

Display the TTDP train consist configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp consists

113.2.9 show ttdp directions

Display the TTDP local ETBN directions configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp directions

113.2.10show ttdp lines

Display the TTDP local ETBN lines configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp lines [<P-1>]

Parameter	Value	Meaning
P-1	1..2	Enter a number in the given range.

113.2.11show ttdp hello-statistics

Display the TTDP hello messages statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp hello-statistics [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.
P-2	1..63	Enter a number in the given range.

113.2.12show ttdp topology corrected-connectivity-table

Display the TTDP corrected connectivity table.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp topology corrected-connectivity-table [<P-1>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.

113.2.13show ttdp topology connectivity-vector

Display the TTDP connectivity vector.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp topology connectivity-vector [<P-1>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.

113.2.14show ttdp topology etbn-vector

Display the ttdp ETBN-vectors.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ttdp topology etbn-vector [<P-1>] [<P-2>]

Parameter	Value	Meaning
P-1	1..63	Enter a number in the given range.
P-2	1..2	Enter a number in the given range.

114Unicast Routing

114.1 routing

Create routing on VLAN.

114.1.1 routing add

Enable routing on VLAN

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: routing add <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

114.1.2 routing delete

Disable routing on VLAN

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: routing delete <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

114.2 ip

Set IP parameters.

114.2.1 ip routing

Enables or disables Routing globally on the device.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip routing

- no ip routing
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip routing

114.2.2 ip source-routing

Enables or disables source routing

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip source-routing

- no ip source-routing
Disable the option
 - ▶ Mode: Global Config Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip source-routing

114.2.3 ip proxy-arp max-delay

Configure the maximum time a Proxy ARP response can be delayed

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip proxy-arp max-delay <P-1>

Parameter	Value	Meaning
P-1	0..1000	Enter Proxy ARP max response delay ms

114.3 show

Display device options and settings.

114.3.1 show ip global

Display the summary information of the IP, including the ICMP rate limit configuration and the global ICMP Redirect configuration.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip global

114.4 show

Display device options and settings.

114.4.1 show ip interface

Display the interface parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

114.4.2 show ip statistics

Display the global IP statistics.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip statistics

114.4.3 show ip template

Display the information about routing resource templates.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip template [<P-1>]

Parameter	Value	Meaning
P-1	configuration	Active and configured template

114.5 ip

IP interface commands.

114.5.1 ip routing

This command enables/disables routing for an interface.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: ip routing
- no ip routing
Disable the option
- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip routing

114.5.2 ip proxy-arp operation

Enables or disables Proxy ARP on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip proxy-arp operation

- no ip proxy-arp operation
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip proxy-arp operation

114.5.3 ip address secondary

Designates whether an IP Address is a secondary address on this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip address secondary <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

- no ip address secondary
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip address secondary <P-1>

114.5.4 ip address primary

Designates whether an IP Address is a primary address on this interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip address primary <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

- no ip address primary
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip address primary

114.5.5 ip mtu

Set MTU size for IP protocol

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip mtu <P-1>

Parameter	Value	Meaning
P-1	68..12266	Set the MTU value.

114.5.6 ip icmp unreachable

Enables or disables the generation of ICMP Destination Unreachable messages.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp unreachable

- no ip icmp unreachable
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip icmp unreachable

114.5.7 ip icmp redirects

Enables or disables the generation of ICMP Redirect messages.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp redirects

- no ip icmp redirects
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip icmp redirects

114.5.8 ip netdirbcast

Enables or disables net directed broadcasts.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip netdirbcast

- no ip netdirbcast
Disable the option
 - ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no ip netdirbcast

114.6 ip

Set IP parameters.

114.6.1 ip route add

Add a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route add <P-1> <P-2> <P-3> [preference <P-4>]
[preference]: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.
P-4	1..255	Enter a number in the given range.

114.6.2 ip route modify

Modify a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route modify <P-1> <P-2> <P-3> [preference <P-4>]
[preference]: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.
P-4	1..255	Enter a number in the given range.

114.6.3 ip route delete

Delete a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route delete <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

114.6.4 ip route distance

Default preference for static routes.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route distance <P-1>

Parameter	Value	Meaning
P-1	1..255	Enter a number in the given range.

114.6.5 ip route track add

Add a track-id for a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route track add <P-1> <P-2> <P-3> <P-4>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.
P-4	string	Track instance.

114.6.6 ip route track delete

Remove a track-id for a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip route track delete <P-1> <P-2> <P-3>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	A.B.C.D	IP address.

114.6.7 ip default-route add

Add a static default route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip default-route add <P-1> [preference <P-2>]
[preference]: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..255	Enter a number in the given range.

114.6.8 ip default-route modify

Modify a static default route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip default-route modify <P-1> preference <P-2>
preference: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	1..255	Enter a number in the given range.

114.6.9 ip default-route delete

Delete a static default route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip default-route delete <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

114.6.10 ip default-route track add

Add a track-id for a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip default-route track add <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	string	Track instance.

114.6.11ip default-route track delete

Remove a track-id for a static route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip default-route track delete <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

114.6.12ip reject-route add

Add a static default route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip reject-route add <P-1> <P-2> [preference <P-3>]
[preference]: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	1..255	Enter a number in the given range.

114.6.13ip reject-route modify

Modify a static reject route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip reject-route modify <P-1> <P-2> preference <P-3>
preference: Change the preference value of a route.

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.
P-3	1..255	Enter a number in the given range.

114.6.14ip reject-route delete

Delete a static reject route entry.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip reject-route delete <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

114.6.15ip template

Select the routing template valid after the next reboot.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip template <P-1>

Parameter	Value	Meaning
P-1	default	Reset to the default template
	IPv4-Default	Default IPv4 routing template
	IPv4-Datacenter	IPv4 datacenter routing template
	IPv4-Unicast	IPv4 unicast only template
	IPv4-Multicast	IPv4 multicast enhanced template

114.6.16ip loopback add

Enable a loopback interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip loopback add <P-1>

Parameter	Value	Meaning
P-1	1..8	Enter the loopback id in the given range.

114.6.17ip loopback delete

Disable a loopback interface.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip loopback delete <P-1>

Parameter	Value	Meaning
P-1	1..8	Enter the loopback id in the given range.

114.6.18ip icmp redirects

Enables or disables the generation of ICMP Redirect messages.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp redirects

■ no ip icmp redirects

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip icmp redirects

114.6.19ip icmp echo-reply

Enables or disables the generation of ICMP Echo Reply messages.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp echo-reply

■ no ip icmp echo-reply

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no ip icmp echo-reply

114.6.20ip icmp rate-limit interval

Configure ICMP rate limit interval in milliseconds to compute the average rate (interval/burst-size). The rate is the average minimum time between subsequent ICMP packets, using a token bucket algorithm. In times without ICMP packets, the tokens accumulate to allow for burst of up to 6 packets. A granularity of less than 10ms is not guaranteed.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp rate-limit interval <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	configure the interval.

114.6.21ip icmp rate-limit interval

Specifies the average minimum time between subsequent ICMP packets for each destination, using a token bucket filter. In times without ICMP packets, the tokens accumulate to allow for bursts of up to burst-size packets. A granularity of less than 10ms is not guaranteed.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp rate-limit interval <P-1>

Parameter	Value	Meaning
P-1	0..2147483647	configure the interval.

114.6.22ip icmp rate-limit burst-size

Configure ICMP rate limit burst-size to compute the average rate (interval/burst-size). A granularity of less than 10ms is not guaranteed.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp rate-limit burst-size <P-1>

Parameter	Value	Meaning
P-1	1..200	configure the burst-size.

114.6.23 ip icmp rate-limit burst-size

The size of the token bucket, fixed at 6 tokens.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip icmp rate-limit burst-size <P-1>

Parameter	Value	Meaning
P-1	1..200	configure the burst-size.

114.6.24 ip source-interface file-transfers

Configure the global source-interface for file-transfers (physical or logical).

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: ip source-interface file-transfers <P-1>

Parameter	Value	Meaning
P-1	slot no./port no.	

114.7 show

Display device options and settings.

114.7.1 show ip route all

Display the static, dynamic and local routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip route all

114.7.2 show ip route local

Display the local routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip route local

114.7.3 show ip route static

Display the static routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip route static

114.7.4 show ip route entry

Display the router route entry information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip route entry <P-1> <P-2>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.
P-2	A.B.C.D	IP address.

114.7.5 show ip route tracking

Display the tracking information for static routes.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip route tracking

114.7.6 show ip entry

Display the router route entry information.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show ip entry <P-1>

Parameter	Value	Meaning
P-1	A.B.C.D	IP address.

115User Management

115.1 show

Display device options and settings.

115.1.1 show custom-role global

Display the common information of custom role.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show custom-role global [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

115.1.2 show custom-role commands

Display the included and excluded commands.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show custom-role commands [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

116Users

116.1 users

Manage Users and User Accounts.

116.1.1 users add

Add a new user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users add <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

116.1.2 users delete

Delete an existing user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users delete <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

116.1.3 users enable

Enable user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users enable <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

116.1.4 users disable

Disable user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users disable <P-1>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).

116.1.5 users password

Change user password.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users password <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	string	Enter a user-defined text, max. 64 characters.

116.1.6 users snmpv3 authentication

Specify authentication setting for a user.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Administrator
- ▶ Format: users snmpv3 authentication <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	md5	MD5 as SNMPv3 user authentication mode.
	sha1	SHA1 as SNMPv3 user authentication mode.

116.1.7 users snmpv3 encryption

Specify encryption settings for a user.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users snmpv3 encryption <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	none	SNMPv3 encryption method is none.
	des	DES as SNMPv3 encryption method.
	aescfb128	AES-128 as SNMPv3 encryption method.

116.1.8 users snmpv3 password encryption

Change the SNMPv3 encryption password.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users snmpv3 password encryption <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	string	Enter a user-defined text, max. 64 characters.

116.1.9 users snmpv3 password authentication

Change the SNMPv3 authentication password.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users snmpv3 password authentication <P-1> [<P-2>]

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	string	Enter a user-defined text, max. 64 characters.

116.1.10 users access-role

Specify snmpv3 access role for a user.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users access-role <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	slot no./port no.	

116.1.11 users lock-status

Set the lockout status of a specified user.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users lock-status <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	unlock	Unlock specific user. User can login again.

116.1.12 users password-policy-check

Set password policy check option. The device checks the "minimum password length", regardless of the setting for this option.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: users password-policy-check <P-1> <P-2>

Parameter	Value	Meaning
P-1	string	<user> User name (up to 32 characters).
P-2	enable	Enable the option.
	disable	Disable the option.

116.2 show

Display device options and settings.

116.2.1 show users

Display the users and user accounts information.

- ▶ **Mode:** Command is in all modes available.
- ▶ **Privilege Level:** Administrator
- ▶ **Format:** show users

117Virtual LAN (VLAN)

117.1 name

117.1.1 name

Assign a name to a VLAN

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: name <P-1> <P-2>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	string	Enter a user-defined text, max. 32 characters.

117.2 vlan-unaware-mode

117.2.1 vlan-unaware-mode

Enable or disable VLAN unaware mode.

- ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: vlan-unaware-mode
- no vlan-unaware-mode
Disable the option
- ▶ Mode: VLAN Database Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: no vlan-unaware-mode

117.3 vlan

Creation and configuration of VLANS.

117.3.1 vlan add

Create a VLAN

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan add <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.3.2 vlan delete

Delete a VLAN

- ▶ Mode: VLAN Database Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan delete <P-1>

Parameter	Value	Meaning
P-1	2..4042	Enter VLAN ID. VLAN ID 1 can not be deleted or created

117.4 vlan

Configure 802.1Q port parameters for VLANs.

117.4.1 vlan acceptframe

Configure how to handle tagged/untagged frames received.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan acceptframe <P-1>

Parameter	Value	Meaning
P-1	all	Untagged frames or priority frames received on this interface are accepted and assigned the value of the interface VLAN ID for this port.
	vlanonly	Only frames received with a VLAN tag will be forwarded. All other frames will be dropped.

117.4.2 vlan ingressfilter

Enable/Disable application of Ingress Filtering Rules.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan ingressfilter

■ no vlan ingressfilter

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no vlan ingressfilter

117.4.3 vlan priority

Configure the priority for untagged frames.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan priority <P-1>

Parameter	Value	Meaning
P-1	0..7	Enter a number in the given range.

117.4.4 vlan pvid

Configure the VLAN id for a specific port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan pvid <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.4.5 vlan tagging

Enable or disable tagging for a specific VLAN port.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan tagging <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

■ no vlan tagging

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no vlan tagging <P-1>

117.4.6 vlan participation include

vlan participation to include

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan participation include <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.4.7 vlan participation exclude

vlan participation to exclude

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan participation exclude <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.4.8 vlan participation auto

vlan participation to auto

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: vlan participation auto <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.5 show

Display device options and settings.

117.5.1 show vlan id

Display the configuration of a single specified VLAN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan id <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.5.2 show vlan brief

Display the general VLAN parameters.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan brief

117.5.3 show vlan port

Display the VLAN configuration of a single port.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan port [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

117.5.4 show vlan member current

Display the membership of ports in static VLAN or dynamically created.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan member current

117.5.5 show vlan member static

Display the membership of ports in static VLAN.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show vlan member static

117.6 network

Configure the inband and outband connectivity.

117.6.1 network management vlan

Configure the management VLAN ID of the switch.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network management vlan <P-1>

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.

117.6.2 network management priority dot1p

Configure the management VLAN priority of the switch.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network management priority dot1p <P-1>

Parameter	Value	Meaning
P-1	0..7	Enter a number in the given range.

117.6.3 network management priority ip-dscp

Configure the management VLAN ip-dscp priority of the switch.

- ▶ Mode: Privileged Exec Mode
- ▶ Privilege Level: Operator
- ▶ Format: network management priority ip-dscp <P-1>

Parameter	Value	Meaning
P-1	0..63	Enter a number in the given range.

118Voice VLAN

118.1 voice

Configure voice VLAN.

118.1.1 voice vlan

Enable or disable the voice VLAN feature.

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan

■ no voice vlan

Disable the option

- ▶ Mode: Global Config Mode
- ▶ Privilege Level: Operator
- ▶ Format: no voice vlan

118.2 voice

Configure voice VLAN.

118.2.1 voice vlan vlan-id

Set and configure the vlan-id interface mode.

- ▶ Mode: Interface Range Mode
 - ▶ Privilege Level: Operator
 - ▶ Format: voice vlan vlan-id <P-1> [dot1p <P-2>]
- [dot1p]: Set and configure the vlan id and dot1p interface mode.

Parameter	Value	Meaning
P-1	1..4042	Enter the VLAN ID.
P-2	0	priority 0
	1	priority 1
	2	priority 2
	3	priority 3
	4	priority 4
	5	priority 5
	6	priority 6
	7	priority 7
	255	default

118.2.2 voice vlan dot1p

Set and configure the dot1p voice vlan interface mode.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan dot1p <P-1>

Parameter	Value	Meaning
P-1	0	priority 0
	1	priority 1
	2	priority 2
	3	priority 3
	4	priority 4
	5	priority 5
	6	priority 6
	7	priority 7
	255	default

118.2.3 voice vlan dscp

Set and configure the Differentiated Services Code Point value.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan dscp <P-1>

Parameter	Value	Meaning
P-1	<0..63>	Differentiated Services Code Point value.
	af11	Match packets with AF11 dscp.
	af12	Match packets with AF12 dscp.
	af13	Match packets with AF13 dscp.
	af21	Match packets with AF21 dscp.
	af22	Match packets with AF22 dscp.
	af23	Match packets with AF23 dscp.
	af31	Match packets with AF31 dscp.
	af32	Match packets with AF32 dscp.
	af33	Match packets with AF33 dscp.
	af41	Match packets with AF41 dscp.
	af42	Match packets with AF42 dscp.
	af43	Match packets with AF43 dscp.
	cs1	Match packets with CS1 dscp.
	cs2	Match packets with CS2 dscp.
	cs3	Match packets with CS3 dscp.
	cs4	Match packets with CS4 dscp.
	cs5	Match packets with CS5 dscp.
	cs6	Match packets with CS6 dscp.
	cs7	Match packets with CS7 dscp.
	default	Match packets with default dscp.
	ef	Match packets with EF dscp.

118.2.4 voice vlan none

Configure the none voice VLAN interface mode.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan none

118.2.5 voice vlan untagged

Configure the untagged voice VLAN interface mode.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan untagged

118.2.6 voice vlan disable

Disable voice VLAN on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan disable

118.2.7 voice vlan auth

Set voice VLAN Authentication Mode on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan auth

■ no voice vlan auth

Disable the option

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: no voice vlan auth

118.2.8 voice vlan data priority

Trust/Untrust data traffic on the interface.

- ▶ Mode: Interface Range Mode
- ▶ Privilege Level: Operator
- ▶ Format: voice vlan data priority <P-1>

Parameter	Value	Meaning
P-1	trust	Trust data traffic on an interface.
	untrust	Untrust data traffic on an interface.

118.3 show

Display device options and settings.

118.3.1 show voice vlan global

Display the current global Voice VLAN admin mode.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show voice vlan global

118.3.2 show voice vlan interface

Display a summary of the current Voice VLAN configuration for a specific port or for all ports.

- ▶ Mode: Command is in all modes available.
- ▶ Privilege Level: Guest
- ▶ Format: show voice vlan interface [<P-1>]

Parameter	Value	Meaning
P-1	slot no./port no.	

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at <https://www.hirschmann.com>.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at <https://hirschmann-support.belden.com>.

This site also includes a free of charge knowledge base and a software download section.

Technical Documents

The current manuals and operating instructions for Hirschmann products are available at <https://www.doc.hirschmann.com>.

Customer Innovation Center

The Customer Innovation Center is ahead of its competitors on three counts with its complete range of innovative services:

- ▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- ▶ Training offers you an introduction to the basics, product briefing and user training with certification. You find the training courses on technology and products currently available at <https://www.belden.com/solutions/customer-innovation-center>.
- ▶ Support ranges from the first installation through the standby service to maintenance concepts.

With the Customer Innovation Center, you decide against any compromise in any case. Our client-customized package leaves you free to choose the service components you want to use.

B Readers' Comments

What is your opinion of this manual? We are constantly striving to provide as comprehensive a description of our product as possible, as well as important information to assist you in the operation of this product. Your comments and suggestions help us to further improve the quality of our documentation.

Your assessment of this manual:

	Very Good	Good	Satisfactory	Mediocre	Poor
Precise description	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Readability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understandability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Examples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprehensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graphics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drawings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Did you discover any errors in this manual?
If so, on what page?

Suggestions for improvement and additional information:

General comments:

Sender:

Company / Department:

Name / Telephone number:

Street:

Zip code / City:

E-mail:

Date / Signature:

Dear User,

Please fill out and return this page

- ▶ as a fax to the number +49 (0)7127/14-1600 or
- ▶ per mail to

Hirschmann Automation and Control GmbH
Department 01RD-NT
Stuttgarter Str. 45-51
72654 Neckartenzlingen



HIRSCHMANN

A **BELDEN** BRAND