Reference Manual

Command Line Interface (CLI)
HiOS (Global Overview)
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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 Command Line Interface, or HiView the first time you log on to the device.
- Log on to the device 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 on to the device again with your new password.

Anmerkung: If you lost your password, then use the System Monitor to reset the password.

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 9.0.

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>active-and-passive</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>active-only</td>
<td>Configure only active detection. During IP address configuration 'active' the device sends only one ARP or NDP probe into the network.</td>
</tr>
<tr>
<td></td>
<td>passive-only</td>
<td>Configure passive detection. The device listens passively on the network to verify that another device does not have the same IP address assigned.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>20..500</td>
<td>Time gap between consecutive ARP or NDP probes ([ms], default 200).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>3..3600</td>
<td>Delay between consecutive probe cycles after a conflict was detected ([sec], default 15).</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>Maximum number of frequent address protections (default 1).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>20..10000</td>
<td>Delay between two consecutive protections ([ms], default 10000).</td>
</tr>
</tbody>
</table>

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> [index <index>] deny src <src> dst <dst> [ethertype <ethertype>] [vlan <vlan>] [cos <cos>] [log] [time-range <time-range>] permit src <src> dst <dst> [ethertype <ethertype>] [vlan <vlan>] [cos <cos>] [log] [time-range <time-range>]

[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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..1023</td>
<td>Access-list rule index.</td>
</tr>
<tr>
<td>P-3</td>
<td>any</td>
<td>Enter for any source MAC address and mask.</td>
</tr>
<tr>
<td>srcmac-macmask</td>
<td></td>
<td>Enter source MAC and source MAC mask.</td>
</tr>
<tr>
<td>P-4</td>
<td>any</td>
<td>Enter for any destination Mac address and mask.</td>
</tr>
<tr>
<td>destmac-macmask</td>
<td></td>
<td>Enter destination MAC and destination MAC mask.</td>
</tr>
<tr>
<td>P-5</td>
<td>0x0600-0xffff</td>
<td>Ethertype value</td>
</tr>
<tr>
<td>appletalk</td>
<td></td>
<td>Appletalk</td>
</tr>
<tr>
<td>arp</td>
<td>ARP</td>
<td></td>
</tr>
<tr>
<td>ibmsna</td>
<td>IBM SNA</td>
<td></td>
</tr>
<tr>
<td>ipv4</td>
<td>IPv4</td>
<td></td>
</tr>
<tr>
<td>ipv6</td>
<td>IPv6</td>
<td></td>
</tr>
<tr>
<td>ipx-old</td>
<td>IPX-OLD</td>
<td></td>
</tr>
<tr>
<td>mpls-mcast</td>
<td>MPLS Multicast</td>
<td></td>
</tr>
<tr>
<td>mpls-unicast</td>
<td>MPLS Unicast</td>
<td></td>
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<td>NetBIOS</td>
<td></td>
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<td>NOVELL</td>
<td></td>
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<td>ppoe</td>
<td>PPPoE</td>
<td></td>
</tr>
<tr>
<td>rarp</td>
<td>RARP</td>
<td></td>
</tr>
<tr>
<td>P-6</td>
<td>eq</td>
<td>Specify VLAN value.</td>
</tr>
<tr>
<td>P-7</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-8</td>
<td>0..7</td>
<td>COS</td>
</tr>
<tr>
<td>P-9</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-10</td>
<td>any</td>
<td>Enter for any source MAC address and mask.</td>
</tr>
<tr>
<td>srcmac-macmask</td>
<td></td>
<td>Enter source MAC and source MAC mask.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..1023</td>
<td>Access-list rule index.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..1042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-3</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-3</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-4</td>
<td>1.4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>

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
MAC interface commands.

2.2.1 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1.4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>

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

2.2.2 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1.4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>
2.3 ip

Set IP parameters.

2.3.1 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> [proto <P-4>] [flag <P-5>] [icmp-type <P-6>] [icmp-code <P-7>] [igmp-type <P-8>] [fragments] [precedence <P-9>] [log] [time-range <P-10>] [assign-queue <P-11>] [tos <P-12>] [log] [time-range <P-13>] [assign-queue <P-14>] [fragments] [precedence <P-15>] [log] [time-range <P-16>] [assign-queue <P-17>] [dscp <P-18>] [log] [time-range <P-19>] [assign-queue <P-20>] [log] [time-range <P-21>] [assign-queue <P-22>] [log] [time-range <P-23>] [assign-queue <P-24>] [fragments] [precedence <P-25>] [log] [time-range <P-26>] [assign-queue <P-27>] [log] [time-range <P-28>] [assign-queue <P-29>] every log [time-range <P-30>] [assign-queue <P-31>] [log] [time-range <P-32>] [assign-queue <P-33>] [log] [time-range <P-34>] [assign-queue <P-35>] [log] [time-range <P-36>] [assign-queue <P-37>] [log] [time-range <P-38>] [assign-queue <P-39>] [log] [time-range <P-40>] [assign-queue <P-41>] [log] [time-range <P-42>] [assign-queue <P-43>] [log] [time-range <P-44>] [assign-queue <P-45>] [log] [time-range <P-46>] [assign-queue <P-47>] [log] [time-range <P-48>] [assign-queue <P-49>] [log] [time-range <P-50>] [assign-queue <P-51>] [log] [time-range <P-52>] [assign-queue <P-53>] [log] [time-range <P-54>] [assign-queue <P-55>] [log] [time-range <P-56>] [assign-queue <P-57>] [log] [time-range <P-58>] [assign-queue <P-59>] [log] [time-range <P-60>] [assign-queue <P-61>] [log] [time-range <P-62>] [assign-queue <P-63>] [log] [time-range <P-64>] [assign-queue <P-65>] [log] [time-range <P-66>] [assign-queue <P-67>] [log] [time-range <P-68>] [assign-queue <P-69>] [log] [time-range <P-70>] [assign-queue <P-71>] [log] [time-range <P-72>] [assign-queue <P-73>] [log] [time-range <P-74>] [assign-queue <P-75>] [log] [time-range <P-76>] [assign-queue <P-77>] [log] [time-range <P-78>] [assign-queue <P-79>] [log] [time-range <P-80>] [assign-queue <P-81>] [log] [time-range <P-82>]

 indexPath]: 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.
[log]: Enable logging
[time-range]: Activate the rule at an absolute time or periodically.
[assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
[log]: Enable logging
[time-range]: Activate the rule at an absolute time or periodically.
[assign-queue]: Configure the User Priority (VLAN priority) assignment attribute.
[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.
[rate-limit]: Set rate limit and burst size.
[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.
[rate-limit]: Set rate limit and burst size.
[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.
[rate-limit]: Set rate limit and burst size.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..1023</td>
<td>Access-list rule index.</td>
</tr>
<tr>
<td>P-3</td>
<td>any</td>
<td>Enter for any source ip address and mask.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d-e.f.g.h</td>
<td>Source IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.</td>
</tr>
<tr>
<td>P-4</td>
<td>eq</td>
<td>Specify value that port number must be equal to.</td>
</tr>
<tr>
<td></td>
<td>neq</td>
<td>Specify value that port number must not be equal to.</td>
</tr>
<tr>
<td></td>
<td>lt</td>
<td>Specify value that port number must be less than.</td>
</tr>
<tr>
<td></td>
<td>gt</td>
<td>Specify value that port number must be greater than.</td>
</tr>
<tr>
<td>P-5</td>
<td>domain</td>
<td>Domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
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<tr>
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<td>WWW</td>
</tr>
<tr>
<td></td>
<td>1-65535</td>
<td>Port number</td>
</tr>
<tr>
<td>P-6</td>
<td>any</td>
<td>Enter for any destination ip address and mask.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d-e.f.g.h</td>
<td>Destination IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.</td>
</tr>
<tr>
<td>P-7</td>
<td>eq</td>
<td>Specify value that port number must be equal to.</td>
</tr>
<tr>
<td></td>
<td>neq</td>
<td>Specify value that port number must not be equal to.</td>
</tr>
<tr>
<td></td>
<td>lt</td>
<td>Specify value that port number must be less than.</td>
</tr>
<tr>
<td></td>
<td>gt</td>
<td>Specify value that port number must be greater than.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
<td>Meaning</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>P-8</td>
<td>domain</td>
<td>Domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
<td>Echo</td>
</tr>
<tr>
<td></td>
<td>ftp</td>
<td>FTP</td>
</tr>
<tr>
<td></td>
<td>ftpdata</td>
<td>FTP Data</td>
</tr>
<tr>
<td></td>
<td>http</td>
<td>HTTP</td>
</tr>
<tr>
<td></td>
<td>https</td>
<td>HTTPS</td>
</tr>
<tr>
<td></td>
<td>smtp</td>
<td>SMTP</td>
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<tr>
<td></td>
<td>snmp</td>
<td>SNMP</td>
</tr>
<tr>
<td></td>
<td>telnet</td>
<td>Telnet</td>
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<tr>
<td></td>
<td>ssh</td>
<td>SSH</td>
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<td></td>
<td>tftp</td>
<td>TFTP</td>
</tr>
<tr>
<td></td>
<td>www</td>
<td>WWW</td>
</tr>
<tr>
<td></td>
<td>1-65535</td>
<td>Port number</td>
</tr>
<tr>
<td>P-9</td>
<td>icmp</td>
<td>ICMP</td>
</tr>
<tr>
<td></td>
<td>igmp</td>
<td>IGMP</td>
</tr>
<tr>
<td></td>
<td>ip-in-ip</td>
<td>IP-in-IP</td>
</tr>
<tr>
<td></td>
<td>tcp</td>
<td>TCP</td>
</tr>
<tr>
<td></td>
<td>udp</td>
<td>UDP</td>
</tr>
<tr>
<td></td>
<td>ip</td>
<td>Any IP protocol</td>
</tr>
<tr>
<td></td>
<td>1-255</td>
<td>Protocol number</td>
</tr>
<tr>
<td>P-10</td>
<td>-fin</td>
<td>Match occurs if fin flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+fin</td>
<td>Match occurs if fin flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-11</td>
<td>-syn</td>
<td>Match occurs if syn flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+syn</td>
<td>Match occurs if syn flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-12</td>
<td>-rst</td>
<td>Match occurs if rst flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+rst</td>
<td>Match occurs if rst flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-13</td>
<td>-psh</td>
<td>Match occurs if psh flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+psh</td>
<td>Match occurs if psh flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-14</td>
<td>-ack</td>
<td>Match occurs if ack flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+ack</td>
<td>Match occurs if ack flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-15</td>
<td>-urg</td>
<td>Match occurs if urg flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+urg</td>
<td>Match occurs if urg flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-16</td>
<td>established</td>
<td>Match occurs if the specified RST and ACK bits are set in TCP header.</td>
</tr>
<tr>
<td>P-17</td>
<td>0..255</td>
<td>ICMP type value.</td>
</tr>
<tr>
<td>P-18</td>
<td>0..255</td>
<td>ICMP code value.</td>
</tr>
<tr>
<td>P-19</td>
<td>0..255</td>
<td>IGMP code value.</td>
</tr>
<tr>
<td>P-20</td>
<td>0..7</td>
<td>IP Precedence</td>
</tr>
<tr>
<td>P-21</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-22</td>
<td>0..7</td>
<td>User priority (VLAN priority).</td>
</tr>
<tr>
<td>P-23</td>
<td>0..255</td>
<td>TOS</td>
</tr>
<tr>
<td>P-24</td>
<td>0..255</td>
<td>TOS Mask</td>
</tr>
<tr>
<td>P-25</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-26</td>
<td>0..7</td>
<td>User priority (VLAN priority).</td>
</tr>
<tr>
<td>P-27</td>
<td>0..63</td>
<td>DSCP</td>
</tr>
<tr>
<td>P-28</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-29</td>
<td>0..7</td>
<td>User priority (VLAN priority).</td>
</tr>
<tr>
<td>P-30</td>
<td>0..7</td>
<td>User priority (VLAN priority).</td>
</tr>
<tr>
<td>P-31</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-32</td>
<td>any</td>
<td>Enter for any source ip address and mask.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d-e.f.g.h</td>
<td>Source IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.</td>
</tr>
<tr>
<td>P-33</td>
<td>eq</td>
<td>Specify value that port number must be equal to.</td>
</tr>
<tr>
<td></td>
<td>neq</td>
<td>Specify value that port number must not be equal to.</td>
</tr>
<tr>
<td></td>
<td>lt</td>
<td>Specify value that port number must be less than.</td>
</tr>
<tr>
<td></td>
<td>gt</td>
<td>Specify value that port number must be greater than.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
<td>Meaning</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>P-34</td>
<td>domain</td>
<td>Domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
<td>Echo</td>
</tr>
<tr>
<td></td>
<td>ftp</td>
<td>FTP</td>
</tr>
<tr>
<td></td>
<td>ftpdata</td>
<td>FTP Data</td>
</tr>
<tr>
<td></td>
<td>http</td>
<td>HTTP</td>
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<td></td>
<td>https</td>
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<td>smtp</td>
<td>SMTP</td>
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<td>Telnet</td>
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<tr>
<td></td>
<td>ssh</td>
<td>SSH</td>
</tr>
<tr>
<td></td>
<td>sftp</td>
<td>TFTP</td>
</tr>
<tr>
<td></td>
<td>www</td>
<td>WWW</td>
</tr>
<tr>
<td></td>
<td>1-65535</td>
<td>Port number</td>
</tr>
<tr>
<td>P-35</td>
<td>any</td>
<td>Enter for any destination ip address and mask.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d-e.f.g.h</td>
<td>Destination IP address and mask (mask in wild-card notation) e.g 192.168.1.1-0.0.0.255.</td>
</tr>
<tr>
<td>P-36</td>
<td>eq</td>
<td>Specify value that port number must be equal to.</td>
</tr>
<tr>
<td></td>
<td>neq</td>
<td>Specify value that port number must not be equal to.</td>
</tr>
<tr>
<td></td>
<td>lt</td>
<td>Specify value that port number must be less than.</td>
</tr>
<tr>
<td></td>
<td>gt</td>
<td>Specify value that port number must be greater than.</td>
</tr>
<tr>
<td>P-37</td>
<td>domain</td>
<td>Domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
<td>Echo</td>
</tr>
<tr>
<td></td>
<td>ftp</td>
<td>FTP</td>
</tr>
<tr>
<td></td>
<td>ftpdata</td>
<td>FTP Data</td>
</tr>
<tr>
<td></td>
<td>http</td>
<td>HTTP</td>
</tr>
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<td>https</td>
<td>HTTPS</td>
</tr>
<tr>
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<td>smtp</td>
<td>SMTP</td>
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<tr>
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<td>SNMP</td>
</tr>
<tr>
<td></td>
<td>telnet</td>
<td>Telnet</td>
</tr>
<tr>
<td></td>
<td>ssh</td>
<td>SSH</td>
</tr>
<tr>
<td></td>
<td>sftp</td>
<td>TFTP</td>
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<tr>
<td></td>
<td>www</td>
<td>WWW</td>
</tr>
<tr>
<td></td>
<td>1-65535</td>
<td>Port number</td>
</tr>
<tr>
<td>P-38</td>
<td>icmp</td>
<td>ICMP</td>
</tr>
<tr>
<td></td>
<td>igmp</td>
<td>IGMP</td>
</tr>
<tr>
<td></td>
<td>ip-in-ip</td>
<td>IP-in-IP</td>
</tr>
<tr>
<td></td>
<td>tcp</td>
<td>TCP</td>
</tr>
<tr>
<td></td>
<td>udp</td>
<td>UDP</td>
</tr>
<tr>
<td></td>
<td>ip</td>
<td>Any IP protocol</td>
</tr>
<tr>
<td></td>
<td>1-255</td>
<td>Protocol number</td>
</tr>
<tr>
<td>P-39</td>
<td>-fin</td>
<td>Match occurs if fin flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+fin</td>
<td>Match occurs if fin flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-40</td>
<td>-syn</td>
<td>Match occurs if syn flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+syn</td>
<td>Match occurs if syn flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-41</td>
<td>-rst</td>
<td>Match occurs if rst flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+rst</td>
<td>Match occurs if rst flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-42</td>
<td>-psh</td>
<td>Match occurs if psh flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+psh</td>
<td>Match occurs if psh flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-43</td>
<td>-ack</td>
<td>Match occurs if ack flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+ack</td>
<td>Match occurs if ack flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-44</td>
<td>-urg</td>
<td>Match occurs if urg flag is not set in the TCP header.</td>
</tr>
<tr>
<td></td>
<td>+urg</td>
<td>Match occurs if urg flag is set in the TCP header.</td>
</tr>
<tr>
<td>P-45</td>
<td>established</td>
<td>Match occurs if the specified RST and ACK bits are set in TCP header.</td>
</tr>
<tr>
<td>P-46</td>
<td>0.255</td>
<td>ICMP type value.</td>
</tr>
<tr>
<td>P-47</td>
<td>0.255</td>
<td>ICMP code value.</td>
</tr>
<tr>
<td>P-48</td>
<td>0.255</td>
<td>IGMP code value.</td>
</tr>
<tr>
<td>P-49</td>
<td>0.7</td>
<td>IP Precedence</td>
</tr>
<tr>
<td>P-50</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
<tr>
<td>P-51</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-52</td>
<td>0.10000000</td>
<td>Committed rate value, specified in kbps.</td>
</tr>
<tr>
<td>P-53</td>
<td>0.128</td>
<td>Committed burst size value, specified in kbytes.</td>
</tr>
<tr>
<td>P-54</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-55</td>
<td>0.10000000</td>
<td>Committed rate value, specified in kbps.</td>
</tr>
<tr>
<td>P-56</td>
<td>0.128</td>
<td>Committed burst size value, specified in kbytes.</td>
</tr>
<tr>
<td>P-57</td>
<td>0.255</td>
<td>TOS</td>
</tr>
<tr>
<td>P-58</td>
<td>0.255</td>
<td>TOS Mask</td>
</tr>
<tr>
<td>P-59</td>
<td>string</td>
<td>&lt;name&gt; Time-range name</td>
</tr>
</tbody>
</table>
### 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] [time-range] [assign-queue] [mirror] [rate-limit] [redirect] [time-range] every [time-range] [assign-queue] [mirror] [rate-limit] [redirect] [time-limit] [assign-queue] [mirror] [rate-limit] [redirect] [time-limit] [mirror] [rate-limit] [redirect] [time-limit]

### 2.3.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
</tbody>
</table>

### 2.3.4 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..1023</td>
<td>Access-list rule index.</td>
</tr>
</tbody>
</table>

### 2.3.4 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
2.3.5 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-3</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-4</td>
<td>1.4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>

2.4 ip
IP interface commands.

2.4.1 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; ACL name.</td>
</tr>
<tr>
<td>P-2</td>
<td>in</td>
<td>Inbound direction.</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Outbound direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1.4294967295</td>
<td>Sequence</td>
</tr>
</tbody>
</table>

2.4.2 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
### 2.5 show

Display device options and settings.

#### 2.5.1 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`

#### 2.5.2 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>`

#### 2.5.3 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>`

#### 2.5.4 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>`

#### 2.5.5 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>`
3 Application Lists

3.1 applists

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;application&gt; Name of an application list.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;authlist_name&gt; Name of referenced authentication list.</td>
</tr>
</tbody>
</table>

3.1.2 appllists enable

Activate a login application list.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;application&gt; Name of an application list.</td>
</tr>
</tbody>
</table>

3.1.3 appllists disable

Deactivate a login application list.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;application&gt; Name of an application list.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;authlist_name&gt; Name of an authentication list.</td>
</tr>
</tbody>
</table>

4.1.2 authlists delete
Delete an existing login authentication list.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: authlists delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;authlist_name&gt; Name of an authentication list.</td>
</tr>
</tbody>
</table>

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>]]]]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;authlist_name&gt; Name of an authentication list.</td>
</tr>
<tr>
<td>P-2</td>
<td>reject</td>
<td>Authentication is rejected / not allowed</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Authentication by local user DB</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>Authentication by RADIUS server</td>
</tr>
<tr>
<td></td>
<td>ias</td>
<td>Authentication by IAS server</td>
</tr>
<tr>
<td></td>
<td>ldap</td>
<td>Authentication by remote server</td>
</tr>
<tr>
<td>P-3</td>
<td>reject</td>
<td>Authentication is rejected / not allowed</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Authentication by local user DB</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>Authentication by RADIUS server</td>
</tr>
<tr>
<td></td>
<td>ias</td>
<td>Authentication by IAS server</td>
</tr>
<tr>
<td></td>
<td>ldap</td>
<td>Authentication by remote server</td>
</tr>
<tr>
<td>P-4</td>
<td>reject</td>
<td>Authentication is rejected / not allowed</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Authentication by local user DB</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>Authentication by RADIUS server</td>
</tr>
<tr>
<td></td>
<td>ias</td>
<td>Authentication by IAS server</td>
</tr>
<tr>
<td></td>
<td>ldap</td>
<td>Authentication by remote server</td>
</tr>
<tr>
<td>P-5</td>
<td>reject</td>
<td>Authentication is rejected / not allowed</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Authentication by local user DB</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>Authentication by RADIUS server</td>
</tr>
<tr>
<td></td>
<td>ias</td>
<td>Authentication by IAS server</td>
</tr>
<tr>
<td></td>
<td>ldap</td>
<td>Authentication by remote server</td>
</tr>
<tr>
<td>P-6</td>
<td>reject</td>
<td>Authentication is rejected / not allowed</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Authentication by local user DB</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>Authentication by RADIUS server</td>
</tr>
<tr>
<td></td>
<td>ias</td>
<td>Authentication by IAS server</td>
</tr>
<tr>
<td></td>
<td>ldap</td>
<td>Authentication by remote server</td>
</tr>
</tbody>
</table>

4.1.4 authlists enable
Activate a login authentication list.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: authlists enable <P-1>
### 4.1.5 authlists disable
Deactivate a login authentication list.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;authlist_name&gt; Name of an authentication list.</td>
</tr>
</tbody>
</table>

### 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>

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

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>30-4294967295</td>
<td>Timer value in seconds.</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>port</td>
<td>Press Enter to execute the command.</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>af11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>af12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>af13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>af21</td>
<td></td>
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<tr>
<td></td>
<td>af22</td>
<td></td>
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<td></td>
<td>af23</td>
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<td></td>
<td>af31</td>
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<td>af32</td>
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<td>af33</td>
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<td>af41</td>
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<td>af42</td>
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<td></td>
<td>af43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cs0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cs1</td>
<td></td>
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<tr>
<td></td>
<td>cs2</td>
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<td>cs3</td>
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<td>ef</td>
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<td>38</td>
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<td>41</td>
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<td>42</td>
<td></td>
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<td></td>
<td>43</td>
<td></td>
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<td></td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td>Enter the 802.1p priority.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>Enter the Traffic Class value.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..3</td>
<td>Enter the Traffic Class value.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>untrusted</td>
<td>Sets the class of service trust mode to untrusted</td>
</tr>
<tr>
<td></td>
<td>dot1p</td>
<td>Sets the class of service trust mode to dot1p.</td>
</tr>
<tr>
<td></td>
<td>ip-dscp</td>
<td>Sets the class of service trust mode to IP DSCP.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td>Enter a Queue Id from 0 to 7.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..3</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

7.3.2 cos-queue weighted

weighted scheduler

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td>Enter a Queue Id from 0 to 7.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..3</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..3</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>Enter a Queue Id from 0 to 7.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..100</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..3</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>Enter a Queue Id from 0 to 7.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..100</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..160</td>
<td>Enter a number in the given range. Setting to 0 will disable the timeout.</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters. Following wildcards are allowed: %d date, %t time, %i IP address, %m MAC address, %p product name</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..250</td>
<td>Screen size for 'more' (23 = default). Enter a 0 will disable the feature. The value is only valid for the current session.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 1024 characters (allowed characters are from ASCII 32 to 127).</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>YYYY-MM-DD</td>
<td>Local date (range: 2004-01-01 - 2037-12-31).</td>
</tr>
<tr>
<td>P-2</td>
<td>HH:MM:SS</td>
<td>Local time.</td>
</tr>
</tbody>
</table>

#### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-780.840</td>
<td>Edit the timezone offset (in minutes).</td>
</tr>
</tbody>
</table>

#### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Edit the timezone acronym (max 4 characters).</td>
</tr>
</tbody>
</table>

#### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>disable</td>
<td>Disable recurring summer-time mode.</td>
</tr>
<tr>
<td></td>
<td>recurring</td>
<td>Enable recurring summer-time mode.</td>
</tr>
<tr>
<td></td>
<td>eu</td>
<td>Enable recurring summer-time used in most parts of the European Union.</td>
</tr>
<tr>
<td></td>
<td>usa</td>
<td>Enable recurring summer-time used in most parts of the USA.</td>
</tr>
</tbody>
</table>

#### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td></td>
<td>first</td>
<td></td>
</tr>
<tr>
<td></td>
<td>second</td>
<td></td>
</tr>
<tr>
<td></td>
<td>third</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fourth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>last</td>
<td></td>
</tr>
</tbody>
</table>
### 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>`

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

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Edit the timezone acronym (max 4 characters).</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>30..600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>sd</td>
<td>SD-Card</td>
</tr>
<tr>
<td></td>
<td>usb</td>
<td>USB Storage Device</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>sd</td>
<td>SD-Card</td>
</tr>
<tr>
<td></td>
<td>usb</td>
<td>USB Storage Device</td>
</tr>
</tbody>
</table>

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>`

```
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>`

```
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>`

```
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>

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

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>normal</td>
<td>Normal Mode</td>
</tr>
<tr>
<td></td>
<td>compatibility</td>
<td>Compatibility Mode</td>
</tr>
</tbody>
</table>

- 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>nvm</td>
<td>You can only select nvm for this command.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..20</td>
<td>Index of the profile entry.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>nvm</td>
<td>non-volatile memory</td>
</tr>
<tr>
<td></td>
<td>envm</td>
<td>external non-volatile memory device</td>
</tr>
<tr>
<td>P-2</td>
<td>1..20</td>
<td>Index of the profile entry.</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter hash as 40 hexa-decimal characters.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..20</td>
<td>Index of the profile entry.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter hash as 40 hexa-decimal characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter hash as 40 hexa-decimal characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..20</td>
<td>Index of the profile entry.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter hash as 40 hexa-decimal characters.</td>
</tr>
</tbody>
</table>

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
do 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>

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>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
</tbody>
</table>

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>]
- **[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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

10.3.5 copy config running-config nvm

Copy the running-config to non-volatile memory.

- **Mode:** Privileged Exec Mode
- **Privilege Level:** Operator
- **Format:** copy config running-config nvm [profile <P-1>]
- **[profile]:** Save the configuration as a specific profile name.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

10.3.8 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

10.3.9 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

10.3.10 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
10.3.11 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>

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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>keep-ip</td>
<td>Keep the IP parameters for management at clear configuration.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>nvm</td>
<td>non-volatile memory</td>
</tr>
<tr>
<td></td>
<td>envm</td>
<td>external non-volatile memory device</td>
</tr>
<tr>
<td>P-2</td>
<td>1..20</td>
<td>Index of the profile entry.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
<tr>
<td>P-2</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
<tr>
<td>P-2</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;acl-name&gt; Name of ACL.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>`
### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td><code>&lt;acl-name&gt;</code> Name of ACL.</td>
</tr>
</tbody>
</table>

### 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 untrusted 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-1..300</td>
<td>Specifies the rate limit value (in packets per seconds, pps) for Dynamic ARP Inspection (DAI) purposes. The value -1 switches rate limiting off.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..15</td>
<td>Specifies the burst interval value for Dynamic ARP Inspection (DAI) purposes. Because this parameter is optional it leaves unchanged if omitted.</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;filename&gt; Enter a valid filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;filename&gt; Enter a valid filename.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;filename&gt; Enter a valid filename.</td>
</tr>
</tbody>
</table>

12.1.7 debug stppkttrace
Packet tracer for spanning tree protocol.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>
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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4294967294</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;filename&gt; Enter a valid filename.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;filename&gt; Enter a valid filename.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>]

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a valid filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a valid filename.</td>
</tr>
</tbody>
</table>

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.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2</td>
<td>Number of power supply.</td>
</tr>
</tbody>
</table>

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 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

### 13.1.11 device-status module

Configure the monitoring of the specific module.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 13.1.12 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Number of fan modules.</td>
</tr>
</tbody>
</table>

### 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

### 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 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

14.1.11 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

14.1.12 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

14.1.13 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

14.1.14 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
14.1.15 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

```shell
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

14.1.16 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

```shell
no security-status monitor https-certificate
```
Disable the option

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

14.1.17 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

```shell
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

14.1.18 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

```shell
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

14.1.19 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

```shell
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
14.1.20 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 dynamic pool (one or more IPs).
  - static: Add a static pool (one IP).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Pool ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
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. | Remove MAC mode.
| | aa:bb:cc:dd:ee:ff | MAC address.
P-5 | none | Remove ID mode.
| | xx:xx:...:xx | Enter ID in hexadecimal format.
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 relay mode.
| | ipaddr | Enter IP address of the relay.
P-9 | none | Remove relay mode.
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> | 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

Enable a DHCP server pool.
- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `dhcp-server pool mode <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Pool ID.</td>
</tr>
</tbody>
</table>

**no dhcp-server pool mode**

Disable the DHCP server pool.
- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `no dhcp-server pool mode <P-1>`

### 15.2.6 dhcp-server pool delete

Delete a DHCP server pool.
- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `dhcp-server pool delete <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Pool ID.</td>
</tr>
</tbody>
</table>

### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Pool ID.</td>
</tr>
</tbody>
</table>

#### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

#### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;remote-id&gt; Option 82 Remote ID</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>local</td>
<td>Save persistent DHCP Snooping bindings database to a local file.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>15..86400</td>
<td>Interval in seconds at which the persistent DHCP Snooping binding database will be saved. The interval value ranges from 15 to 86400 seconds.</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>
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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td>P-2</td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>

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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]`

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

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>static</td>
<td>Restrict the output based on static bindings.</td>
</tr>
<tr>
<td></td>
<td>dynamic</td>
<td>Restrict the output based on dynamic bindings.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>mac</td>
<td>mac.</td>
</tr>
<tr>
<td>P-3</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>a.b.c.d</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>a.b.c.d</td>
<td>IP subnet mask.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>domain</td>
<td>domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
<td>echo</td>
</tr>
<tr>
<td></td>
<td>ftp</td>
<td>ftp</td>
</tr>
<tr>
<td></td>
<td>ftpdata</td>
<td>ftpdata</td>
</tr>
<tr>
<td></td>
<td>http</td>
<td>http</td>
</tr>
<tr>
<td></td>
<td>smtp</td>
<td>smtp</td>
</tr>
<tr>
<td></td>
<td>snmp</td>
<td>snmp</td>
</tr>
<tr>
<td></td>
<td>telnet</td>
<td>telnet</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>tftp</td>
</tr>
<tr>
<td></td>
<td>www</td>
<td>www</td>
</tr>
<tr>
<td></td>
<td>0-65535</td>
<td>Port number</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>0x0000-0xffff</td>
<td>ethertype</td>
</tr>
<tr>
<td></td>
<td>appletalk</td>
<td>appletalk</td>
</tr>
<tr>
<td></td>
<td>arp</td>
<td>arp</td>
</tr>
<tr>
<td></td>
<td>ibmsna</td>
<td>ibmsna</td>
</tr>
<tr>
<td></td>
<td>ipv4</td>
<td>ipv4</td>
</tr>
<tr>
<td></td>
<td>ipv6</td>
<td>ipv6</td>
</tr>
<tr>
<td></td>
<td>ipx</td>
<td>ipx</td>
</tr>
<tr>
<td></td>
<td>mplsmcast</td>
<td>mplsmcast</td>
</tr>
<tr>
<td></td>
<td>mplsucast</td>
<td>mplsucast</td>
</tr>
<tr>
<td></td>
<td>netbios</td>
<td>netbios</td>
</tr>
<tr>
<td></td>
<td>noveil</td>
<td>noveil</td>
</tr>
<tr>
<td></td>
<td>pppoe</td>
<td>pppoe</td>
</tr>
<tr>
<td></td>
<td>rarp</td>
<td>rarp</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>0-63</td>
<td>Decimal value</td>
</tr>
<tr>
<td></td>
<td>af11</td>
<td>af11</td>
</tr>
<tr>
<td></td>
<td>af12</td>
<td>af12</td>
</tr>
<tr>
<td></td>
<td>af13</td>
<td>af13</td>
</tr>
<tr>
<td></td>
<td>af21</td>
<td>af21</td>
</tr>
<tr>
<td></td>
<td>af22</td>
<td>af22</td>
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<tr>
<td></td>
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<td></td>
<td>af31</td>
<td>af31</td>
</tr>
<tr>
<td></td>
<td>af32</td>
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<tr>
<td></td>
<td>af33</td>
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<tr>
<td></td>
<td>af43</td>
<td>af43</td>
</tr>
<tr>
<td></td>
<td>be</td>
<td>be</td>
</tr>
<tr>
<td></td>
<td>cs0</td>
<td>cs0</td>
</tr>
<tr>
<td></td>
<td>cs1</td>
<td>cs1</td>
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<td>cs6</td>
<td>cs6</td>
</tr>
<tr>
<td></td>
<td>cs7</td>
<td>cs7</td>
</tr>
<tr>
<td></td>
<td>ef</td>
<td>ef</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>Ip precedence value.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>00-ff</td>
<td>Tos bits/mask.</td>
</tr>
<tr>
<td>P-3</td>
<td>00-ff</td>
<td>Tos bits/mask.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>icmp</td>
<td>icmp</td>
</tr>
<tr>
<td></td>
<td>igmp</td>
<td>igmp</td>
</tr>
<tr>
<td></td>
<td>ip</td>
<td>ip</td>
</tr>
<tr>
<td></td>
<td>tcp</td>
<td>tcp</td>
</tr>
<tr>
<td></td>
<td>udp</td>
<td>udp</td>
</tr>
<tr>
<td></td>
<td>0-255</td>
<td>Protocol number</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the Diffserv class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>mac</td>
<td>MAC.</td>
</tr>
<tr>
<td>P-3</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the Diffserv class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>a.b.c.d</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>a.b.c.d</td>
<td>IP subnet mask.</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the Diffserv class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>domain</td>
<td>domain</td>
</tr>
<tr>
<td></td>
<td>echo</td>
<td>echo</td>
</tr>
<tr>
<td></td>
<td>ftp</td>
<td>ftp</td>
</tr>
<tr>
<td></td>
<td>ftpdata</td>
<td>ftpdata</td>
</tr>
<tr>
<td></td>
<td>http</td>
<td>http</td>
</tr>
<tr>
<td></td>
<td>smtp</td>
<td>smtp</td>
</tr>
<tr>
<td></td>
<td>snmp</td>
<td>snmp</td>
</tr>
<tr>
<td></td>
<td>telnet</td>
<td>telnet</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>tftp</td>
</tr>
<tr>
<td></td>
<td>www</td>
<td>www</td>
</tr>
<tr>
<td></td>
<td>0-65535</td>
<td>Port number</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the Diffserv class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
18.2.19 class-map remove
Remove a DiffServ class.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: class-map remove <P-1>  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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>  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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 }  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>in</td>
<td>Traffic direction in.</td>
</tr>
<tr>
<td>P-2</td>
<td>out</td>
<td>Traffic direction out.</td>
</tr>
</tbody>
</table>

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.  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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.  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..7</td>
<td>Assign queue id.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the Diffserv policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the Diffserv class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot 1 / port 1</td>
<td>1/1</td>
</tr>
<tr>
<td></td>
<td>slot 1 / port 2</td>
<td>1/2</td>
</tr>
<tr>
<td></td>
<td>slot 1 / port 3</td>
<td>1/3</td>
</tr>
<tr>
<td></td>
<td>slot 1 / port 4</td>
<td>1/4</td>
</tr>
<tr>
<td></td>
<td>slot 2 / port 1</td>
<td>2/1</td>
</tr>
<tr>
<td></td>
<td>slot 2 / port 2</td>
<td>2/2</td>
</tr>
<tr>
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<td>slot 2 / port 3</td>
<td>2/3</td>
</tr>
<tr>
<td></td>
<td>slot 2 / port 4</td>
<td>2/4</td>
</tr>
<tr>
<td></td>
<td>slot 3 / port 1</td>
<td>3/1</td>
</tr>
<tr>
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<td>slot 3 / port 2</td>
<td>3/2</td>
</tr>
<tr>
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<td>slot 3 / port 3</td>
<td>3/3</td>
</tr>
<tr>
<td></td>
<td>slot 3 / port 4</td>
<td>3/4</td>
</tr>
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<td>slot 4 / port 1</td>
<td>4/1</td>
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<tr>
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<td>slot 4 / port 2</td>
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<td>slot 4 / port 3</td>
<td>4/3</td>
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<td>slot 4 / port 4</td>
<td>4/4</td>
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<td>slot 5 / port 1</td>
<td>5/1</td>
</tr>
<tr>
<td></td>
<td>slot 5 / port 2</td>
<td>5/2</td>
</tr>
<tr>
<td></td>
<td>slot 5 / port 3</td>
<td>5/3</td>
</tr>
<tr>
<td></td>
<td>slot 5 / port 4</td>
<td>5/4</td>
</tr>
<tr>
<td></td>
<td>lag instance 1</td>
<td>lag/1</td>
</tr>
<tr>
<td></td>
<td>lag instance 2</td>
<td>lag/2</td>
</tr>
</tbody>
</table>
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}

**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-dscp-transmit**: set-dscp-transmit
**transmit**: transmit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1 string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
<td></td>
</tr>
<tr>
<td>P-2 string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
<td></td>
</tr>
<tr>
<td>P-3 1..4294967295</td>
<td>Data rate (Kbps).</td>
<td></td>
</tr>
<tr>
<td>P-4 1..128</td>
<td>Burst size (KB).</td>
<td></td>
</tr>
<tr>
<td>P-5 0..7</td>
<td>COS value.</td>
<td></td>
</tr>
<tr>
<td>P-6 af11</td>
<td>af11</td>
<td></td>
</tr>
<tr>
<td>P-12 af12</td>
<td>af12</td>
<td></td>
</tr>
<tr>
<td>P-13 af13</td>
<td>af13</td>
<td></td>
</tr>
<tr>
<td>P-21 af21</td>
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<td>P-22 af22</td>
<td>af22</td>
<td></td>
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<td>P-23 af23</td>
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<td></td>
</tr>
<tr>
<td>P-31 af31</td>
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<td></td>
</tr>
<tr>
<td>P-32 af32</td>
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</tr>
<tr>
<td>P-33 af33</td>
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</tr>
<tr>
<td>P-41 af41</td>
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</tr>
<tr>
<td>P-42 af42</td>
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<td>P-43 af43</td>
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<tr>
<td>af be</td>
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<tr>
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</tr>
<tr>
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<td>cs2 cs2</td>
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<tr>
<td>cs6 cs6</td>
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</tr>
<tr>
<td>cs7 cs7</td>
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<td></td>
</tr>
<tr>
<td>ef ef</td>
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<td></td>
</tr>
<tr>
<td>P-7 0..7</td>
<td>Ip precedence value.</td>
<td></td>
</tr>
<tr>
<td>P-8 0..7</td>
<td>COS value.</td>
<td></td>
</tr>
</tbody>
</table>
### 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`

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4294967295</td>
<td>Data rate (Kbps).</td>
</tr>
<tr>
<td>P-4</td>
<td>1..128</td>
<td>Burst size (KB).</td>
</tr>
<tr>
<td>P-5</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
<tr>
<td>P-6</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
<tr>
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<td>Ip precedence value.</td>
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<td>P-9</td>
<td>0..7</td>
<td>COS value.</td>
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</tbody>
</table>
### 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 violate-action`  
  ```
  <af11|af12|af13|af21|af22|af23|af31|af32|af33|af41|
  af42|af43|be|cs0|cs1|cs2|
  cs3|cs4|cs5|cs6|cs7|ef>
  ```

### Parameters and Meaning

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4294967295</td>
<td>Data rate (Kbps).</td>
</tr>
<tr>
<td>P-4</td>
<td>1..128</td>
<td>Burst size (KB).</td>
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<td>ef</td>
<td>ef</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
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<td>COS value.</td>
</tr>
<tr>
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<tr>
<td>P-8</td>
<td>0..7</td>
<td>Ip precedence value.</td>
</tr>
<tr>
<td>P-9</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>

RM CLI Overview HiOS
Release 9.0 12/2021
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
</tbody>
</table>
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}

Parameter | Value | Meaning
--- | --- | ---
P-2 | string | Enter the DiffServ policy 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.

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.
vviolate-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.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4294967295</td>
<td>Data rate (Kbps).</td>
</tr>
<tr>
<td>P-4</td>
<td>1..128</td>
<td>Burst size (KB).</td>
</tr>
<tr>
<td>P-5</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
<tr>
<td>P-6</td>
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<td>P-6: af11</td>
</tr>
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<td>ef</td>
<td>P-6: ef</td>
</tr>
<tr>
<td>P-7</td>
<td>0..7</td>
<td>Ip precedence value.</td>
</tr>
<tr>
<td>P-8</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>

### 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>
  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-transmit:**
- **set-prec-transmit:**
- **set-sec-cos-transmit:**
- **set-dscp-transmit:**
transmit: transmit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4294967295</td>
<td>Data rate (Kbps).</td>
</tr>
<tr>
<td>P-4</td>
<td>1..128</td>
<td>Burst size (KB).</td>
</tr>
<tr>
<td>P-5</td>
<td>1..4294967295</td>
<td>Data rate (Kbps).</td>
</tr>
<tr>
<td>P-6</td>
<td>1..128</td>
<td>Burst size (KB).</td>
</tr>
<tr>
<td>P-7</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
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<tr>
<td>P-9</td>
<td>0..7</td>
<td>Ip precedence value.</td>
</tr>
<tr>
<td>P-10</td>
<td>0..7</td>
<td>COS value.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>
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>
### 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>`

#### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>in</td>
<td>Traffic direction in</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Traffic direction out</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Traffic direction in</td>
</tr>
<tr>
<td></td>
<td>in</td>
<td>Traffic direction out</td>
</tr>
<tr>
<td>P-2</td>
<td>out</td>
<td>Traffic direction out</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ class name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Traffic direction in</td>
</tr>
<tr>
<td>P-2</td>
<td>in</td>
<td>Traffic direction out</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Traffic direction out</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the DiffServ policy name, max. 31 characters.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>in</td>
<td>Traffic direction in</td>
</tr>
<tr>
<td></td>
<td>out</td>
<td>Traffic direction out</td>
</tr>
</tbody>
</table>
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).

19.1.3 dlr ring delete
Delete the Device Level Ring.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** dlr ring delete <P-1>

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 DLR ring beacon.
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-3</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-4</td>
<td>0..255</td>
<td>The DLR supervisor precedence (default: 0).</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
<tr>
<td>P-6</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-7</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-8</td>
<td>400..100000</td>
<td>The DLR beacon interval time in microseconds (default: 400).</td>
</tr>
<tr>
<td>P-9</td>
<td>1600..500000</td>
<td>The DLR beacon timeout in microseconds (default: 1960).</td>
</tr>
<tr>
<td>P-10</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
<tr>
<td>P-11</td>
<td>fault-location</td>
<td>Verify the fault location.</td>
</tr>
<tr>
<td></td>
<td>clear-rapid-fault</td>
<td>Clear rapid faults.</td>
</tr>
<tr>
<td></td>
<td>restart-sign-on</td>
<td>Restart the Sign On process and refresh the participants list.</td>
</tr>
<tr>
<td></td>
<td>clear-gateway-fault</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>The DLR gateway ID.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..255</td>
<td>The DLR gateway ID.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..255</td>
<td>The DLR gateway ID.</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Enter a user-defined text, max. 256 characters.</td>
</tr>
<tr>
<td>P-6</td>
<td>0..255</td>
<td>The DLR gateway precedence.</td>
</tr>
<tr>
<td>P-7</td>
<td>1000..100000</td>
<td>The DLR gateway advertise interval in microseconds.</td>
</tr>
<tr>
<td>P-8</td>
<td>2500..500000</td>
<td>The DLR gateway advertise timeout in microseconds.</td>
</tr>
<tr>
<td>P-9</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-10</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
</tbody>
</table>

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>]]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..65535</td>
<td>The DLR ring participant ID.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>The DLR gateway ID.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>The DLR ring ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>The DLR gateway ID.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

### 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>`

**Parameter** | **Value** | **Meaning** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>DNS Client hosts index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>DNS Client hosts index.</td>
</tr>
</tbody>
</table>

### 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>`

**Parameter** | **Value** | **Meaning** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>DNS Client hosts index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

### 20.1.10 dns client source

DNS Client configuration source.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** `dns client source <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>user</td>
<td>Use the DNS servers defined by the user.</td>
</tr>
<tr>
<td></td>
<td>mgmt-dhcp</td>
<td>Use the DNS servers received by DHCP on the management interface.</td>
</tr>
<tr>
<td></td>
<td>provider</td>
<td></td>
</tr>
</tbody>
</table>

### 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>`

**Parameter** | **Value** | **Meaning** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>DNS Client servers index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>DNS Client servers index.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>DNS Client servers index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3 enable</td>
<td></td>
<td>Enable the option.</td>
</tr>
<tr>
<td>P-3 disable</td>
<td></td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-4 enable</td>
<td></td>
<td>Enable the option.</td>
</tr>
<tr>
<td>P-4 disable</td>
<td></td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>DNS Client servers index.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>DNS Client servers index.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..3600</td>
<td>The timeout before retransmitting a request to the server (default: 3).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>The number of times the request is retransmitted (default: 2).</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>extern</td>
<td>Display the DNS Client servers received from external sources.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..1472</td>
<td>Max. ICMP payload size (default: 512)</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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

```plaintext
- 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..999999999</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>31..1000000000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..1000000000</td>
<td>The threshold for pdelay in [ns].</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>Set the pdelay message transmission interval to 1s.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Set the pdelay message transmission interval to 2s.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Set the pdelay message transmission interval to 4s.</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Set the pdelay message transmission interval to 8s.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the transmission of pdelay messages.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>Set the announce message transmission interval to 1s.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Set the announce message transmission interval to 2s.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the transmission of announce messages.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.125</td>
<td>Set the sync message transmission interval to 125ms.</td>
</tr>
<tr>
<td></td>
<td>0.25</td>
<td>Set the sync message transmission interval to 250ms.</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>Set the sync message transmission interval to 500ms.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Set the sync message transmission interval to 1s.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the transmission of sync messages.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..10</td>
<td>Define the number of allowed lost announce messages.</td>
</tr>
</tbody>
</table>
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..10</td>
<td>Define the number of allowed lost sync messages.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..10</td>
<td>Define number of allowed lost pdelay messages.</td>
</tr>
</tbody>
</table>

### 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.
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 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

23.1.3 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

23.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

23.1.5 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>
### 23.1.6 dot1x mac-authentication-bypass format letter-case

Specify letter case for MAB.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-</td>
<td>Use hyphen for MAB formatting.</td>
</tr>
<tr>
<td></td>
<td>:</td>
<td>Use colon for MAB formatting.</td>
</tr>
<tr>
<td></td>
<td>.</td>
<td>Use dot for MAB formatting.</td>
</tr>
</tbody>
</table>

#### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>lower-case</td>
<td>Use lower-case for MAB formatting.</td>
</tr>
<tr>
<td></td>
<td>upper-case</td>
<td>Use upper-case for MAB formatting.</td>
</tr>
</tbody>
</table>

### 23.1.7 dot1x mac-authentication-bypass password

Specify global password for MAB.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;password&gt; Enter a valid password for MAB.</td>
</tr>
</tbody>
</table>

### 23.2 dot1x

Configure 802.1X interface parameters.

#### 23.2.1 dot1x guest-vlan

Configure a VLAN as 802.1X guest VLAN.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
</tbody>
</table>

#### 23.2.2 dot1x max-req

Configure the maximum number of requests to be sent.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Maximum number of requests (default: 2).</td>
</tr>
</tbody>
</table>

#### 23.2.3 dot1x max-users

Configure the maximum number of supplicants on a port.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Maximum number of supplicants on a port (default: 16).</td>
</tr>
</tbody>
</table>

#### 23.2.4 dot1x mac-auth-bypass

Configure MAC-Authentication bypass for the port.

- Mode: Interface Range Mode
- Priority Level: Operator
- Format: dot1x mac-auth-bypass

- **no dot1x mac-auth-bypass**
  - Disable the option
    - Mode: Interface Range Mode
    - Priority 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>auto</td>
<td>Port is actually controlled by protocol.</td>
</tr>
<tr>
<td></td>
<td>force-authorized</td>
<td>Port is authorized unconditionally (default).</td>
</tr>
<tr>
<td></td>
<td>force-unauthorized</td>
<td>Port is unauthorized unconditionally.</td>
</tr>
<tr>
<td></td>
<td>multi-client</td>
<td>If more than one client is attached to the port, then each client needs to authenticate separately.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
</tbody>
</table>

23.2.8 dot1x timeout guest-vlan-period

Configure the guest-vlan period value.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** dot1x timeout guest-vlan-period <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..300</td>
<td>Guest-vlan timeout in seconds (default: 90).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Timeout in seconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Quiet period in seconds (default: 60).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Timeout in seconds.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Timeout in seconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Timeout in seconds.</td>
</tr>
</tbody>
</table>

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>]]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>1..4294967294</td>
<td>802.1X history log entry index. This can be specified only if interface is provided. Parameter Usage:[ &lt;slot/port&gt; [index] ]</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>
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.

```plaintext
Mode: Global Config Mode
Privilege Level: Operator
Format: link-aggregation add <P-1>
```

24.1.2 link-aggregation modify
Modify the parameters for the specified Link Aggregation Group.

```plaintext
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>
```

```plaintext
- 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.
```

```plaintext
Parameter Value Meaning
---
P-1 lag/lagport lag/lagport Enter a lag interface in lag/lagport format.
```

24.1.3 link-aggregation delete
Delete the Link Aggregation Group to divide the group into individual connections.

```plaintext
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>src-mac</td>
<td>Source MAC, VLAN, EtherType, and incoming port associated with the packet.</td>
</tr>
<tr>
<td></td>
<td>dst-mac</td>
<td>Destination MAC, VLAN, EtherType, and incoming port associated with the packet.</td>
</tr>
<tr>
<td></td>
<td>src-dst-mac</td>
<td>Source/Destination MAC, VLAN, EtherType, and incoming port associated with the packet.</td>
</tr>
<tr>
<td></td>
<td>src-ip</td>
<td>Source IP and Source TCP/UDP fields of the packet.</td>
</tr>
<tr>
<td></td>
<td>dst-ip</td>
<td>Destination IP and Destination TCP/UDP Port fields of the packet.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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 statelacp-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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

### 24.3 show
Display device options and settings.

#### 24.3.1 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]
24.3.2  `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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.3  `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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.4  `show lacp interface`

Display the LAG interfaces attributes.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show lacp interface [P-1]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.5  `show lacp mode`

Display the LACP mode.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show lacp mode [P-1]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.6  `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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.7  `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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

24.3.8  `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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..200</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..31</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>]]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

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

26.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>10..500000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>a:b:c:d:e:f</td>
<td>Enter a MAC address.</td>
</tr>
<tr>
<td></td>
<td>1..4042</td>
<td>Enter a VLAN ID.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>flood</td>
<td>Unknown multicast frames will be flooded.</td>
</tr>
<tr>
<td></td>
<td>discard</td>
<td>Unknown multicast frames will be discarded.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>10..100</td>
<td>Join time-interval in centiseconds.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>20..600</td>
<td>Leave time-interval in centiseconds.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>200..6000</td>
<td>Leave-All time-interval in centiseconds.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the HiDiscovery protocol.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the HiDiscovery protocol.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>read-write</td>
<td>Allow detection and configuration.</td>
</tr>
<tr>
<td></td>
<td>read-only</td>
<td>Allow only detection, no configuration.</td>
</tr>
</tbody>
</table>

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

29.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>client</td>
<td>The device will be in the role of a ring client (ring-switch).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
<tr>
<td>P-2</td>
<td>modeh</td>
<td>HSR mode h - bridging of HSR traffic (default HSR mode).</td>
</tr>
<tr>
<td></td>
<td>modeu</td>
<td>HSR mode u - like mode h, but unicast messages are not removed.</td>
</tr>
<tr>
<td>P-3</td>
<td>hsrredboxsan</td>
<td>An HSR RedBox with regular Ethernet traffic on its interlink.</td>
</tr>
<tr>
<td></td>
<td>hsrredboxprpa</td>
<td>An HSR RedBox with PRP traffic for LAN A on its interlink.</td>
</tr>
<tr>
<td></td>
<td>hsrredboxprpb</td>
<td>An HSR RedBox with PRP traffic for LAN B on its interlink.</td>
</tr>
<tr>
<td>P-4</td>
<td>id1a</td>
<td>Redbox pair 1 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id1b</td>
<td>Redbox pair 1 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id2a</td>
<td>Redbox pair 2 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id2b</td>
<td>Redbox pair 2 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id3a</td>
<td>Redbox pair 3 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id3b</td>
<td>Redbox pair 3 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id4a</td>
<td>Redbox pair 4 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id4b</td>
<td>Redbox pair 4 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id5a</td>
<td>Redbox pair 5 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id5b</td>
<td>Redbox pair 5 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id6a</td>
<td>Redbox pair 6 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id6b</td>
<td>Redbox pair 6 to LAN B.</td>
</tr>
<tr>
<td></td>
<td>id7a</td>
<td>Redbox pair 7 to LAN A.</td>
</tr>
<tr>
<td></td>
<td>id7b</td>
<td>Redbox pair 7 to LAN B.</td>
</tr>
<tr>
<td>P-5</td>
<td>100</td>
<td>100 MBit/s</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>1000 MBit/s</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>

31.2.3 clear hsr counters

Clear HSR counters.

- **Mode:** Privileged Exec Mode
- **Privilege Level:** Operator
- **Format:** clear hsr counters [P-1]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>

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]
### 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>>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>

### 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>>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter HSR instance number (only 1 supported).</td>
</tr>
</tbody>
</table>
## 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Port number of the HTTP server (default: 80).</td>
</tr>
</tbody>
</table>

#### 32.1.2 http server

Enable or disable the HTTP server.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `http server`

```
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Port number of the web server (default: 443).</td>
</tr>
</tbody>
</table>

33.1.3 https fingerprint-type
Configure fingerprint type.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: https fingerprint-type <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>sha1</td>
<td>Configure sha1 fingerprint</td>
</tr>
<tr>
<td></td>
<td>sha256</td>
<td>Configure sha256 fingerprint</td>
</tr>
</tbody>
</table>

33.1.4 https certificate
Generate/Delete HTTPS X509/PEM certificate.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: https certificate <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>generate</td>
<td>Generates the item</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>Deletes the item</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>
34 Integrated Authentification 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

34.1.2 ias-users delete
Delete an existing IAS user.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ias-users delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

34.1.3 ias-users enable
Enable IAS user.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ias-users enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

34.1.4 ias-users disable
Disable IAS user.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ias-users disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.65535</td>
<td>Port number of the IEC61850 MMS server (default: 102).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..15</td>
<td>Maximum number of concurrent IEC61850 MMS sessions (default: 5).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a IEC61850-7-2 Ed. VisibleString, max. 32 characters. The following characters are allowed: VisibleString ( FROM ('A'</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1..3</td>
<td>Enter igmp version (default: 3).</td>
</tr>
</tbody>
</table>

36.2.3 ip igmp robustness
Configure IGMP router robustness.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** ip igmp robustness <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1..255</td>
<td>Enter igmp query robustness (default: 2).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1..3600</td>
<td>Enter igmp query interval (default: 125).</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.255</td>
<td>Enter igmp last member query interval (default: 10).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.255</td>
<td>Enter igmp query maximum response time (default: 100).</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..260</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1800</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>60..300</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..3</td>
<td>IGMP snooping querier's protocol version(1 to 3,default: 2).</td>
</tr>
</tbody>
</table>

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>
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.
- **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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>discard</td>
<td>Unknown multicast frames will be discarded.</td>
</tr>
<tr>
<td>P-1</td>
<td>flood</td>
<td>Unknown multicast frames will be flooded.</td>
</tr>
<tr>
<td>P-1</td>
<td>query-ports</td>
<td>Unknown multicast frames will be forwarded only to query ports.</td>
</tr>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>2..3600</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..25</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-4</td>
<td>0..3600</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-5</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-6</td>
<td>query-and-registered-ports</td>
<td>Addition of query ports to multicast filter portmasks.</td>
</tr>
<tr>
<td>P-6</td>
<td>registered-ports-only</td>
<td>No addition of query ports to multicast filter portmasks.</td>
</tr>
<tr>
<td>P-7</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-8</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-9</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

**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 static-query-port automatic-mode`

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`
**38.3.2 igmp-snooping fast-leave**
Enable or disable IGMP snooping fast-leave per interface.
- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..25</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**38.3.5 igmp-snooping mctrexpiretime**
Sets the multicast router present expiration time (0-3600) in seconds per interface.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** igmp-snooping mctrexpiretime <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**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

**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]

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]

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]

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]

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]
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

39.2.1 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.
Mode: Interface Range Mode
Privilege Level: Operator
Format: auto-negotiate

no auto-negotiate
Disable the option
Mode: Interface Range Mode
Privilege Level: Operator
Format: no auto-negotiate

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>auto-power-save</td>
<td>The port goes in a low power mode.</td>
</tr>
<tr>
<td></td>
<td>no-power-save</td>
<td>The port does not use the automatic power save mode.</td>
</tr>
</tbody>
</table>

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>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>10</td>
<td>10 MBit/s.</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100 MBit/s.</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>1000 MBit/s.</td>
</tr>
<tr>
<td>P-2</td>
<td>full</td>
<td>full duplex.</td>
</tr>
<tr>
<td></td>
<td>half</td>
<td>half duplex.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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 show
Display device options and settings.

39.12.1 show port
Display the interface parameters.
► Mode: Command is in all modes available.
► Privilege Level: Guest
► Format: show port [<P-1>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

39.13 show
Display device options and settings.

39.13.1 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

39.14 show
Display device options and settings.

39.14.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..3600</td>
<td>Add interval time to monitor the bandwidth utilization.</td>
</tr>
</tbody>
</table>

40.1.2 utilization alarm-threshold lower
Lower threshold value

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** utilization alarm-threshold lower <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..10000</td>
<td>Add alarm threshold lower value for monitoring bandwidth utilization in hundredths of a percent.</td>
</tr>
</tbody>
</table>

40.1.3 utilization alarm-threshold upper
Upper threshold value

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** utilization alarm-threshold upper <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..10000</td>
<td>Add alarm threshold upper value for monitoring bandwidth utilization in hundredths of a percent.</td>
</tr>
</tbody>
</table>

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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>all</td>
<td>Select all VLAN configured.</td>
</tr>
<tr>
<td></td>
<td>vlan</td>
<td>Enter single VLAN.</td>
</tr>
<tr>
<td></td>
<td>vlan range</td>
<td>Enter VLAN range separated by hyphen e.g 1-4.</td>
</tr>
<tr>
<td></td>
<td>vlan list</td>
<td>Enter VLAN list separated by comma e.g 2,4,6,... .</td>
</tr>
<tr>
<td></td>
<td>complex range</td>
<td>Enter VLAN range and several VLAN separated by comma for a list and hyphen for ranges e.g 2-4,6-9,11.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>switch</td>
<td>Start switch debug shell</td>
</tr>
<tr>
<td></td>
<td>ifconfig</td>
<td>Start Linux ifconfig</td>
</tr>
<tr>
<td></td>
<td>osapi-debug</td>
<td>Start osapi debug functions.</td>
</tr>
<tr>
<td></td>
<td>hw-port-reg</td>
<td>Display the hardware port register.</td>
</tr>
<tr>
<td></td>
<td>hw-system-reg</td>
<td>Display the hardware system register.</td>
</tr>
<tr>
<td></td>
<td>hw-sw-temperature</td>
<td>Display the hardware switch temperature register.</td>
</tr>
<tr>
<td></td>
<td>interruptTestAll</td>
<td>Activate all kind of logic interrupts for testing</td>
</tr>
</tbody>
</table>

41.8.3 serviceshell boot fastboot
Enable/disable fastboot
▶ Mode: Privileged Exec Mode
▶ Privilege Level: Administrator
▶ Format: serviceshell boot fastboot <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>start</td>
<td>Start mark test</td>
</tr>
<tr>
<td></td>
<td>clear-all</td>
<td>Clear all mark test</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>PARAM_BOOT_MAIN_SECTION</td>
<td>Set a parameter invalid in a parameter block.</td>
</tr>
<tr>
<td></td>
<td>PARAM_BOOT_ICMA_GE_START_0</td>
<td>Set a parameter invalid in a parameter block.</td>
</tr>
<tr>
<td></td>
<td>PARAM_BOOT_ICMA_GE_START_1</td>
<td>Set a parameter invalid in a parameter block.</td>
</tr>
<tr>
<td></td>
<td>PARAM_BOOT_ICMA_GE_START_2</td>
<td>Set a parameter invalid in a parameter block.</td>
</tr>
<tr>
<td></td>
<td>PARAM_BOOT_ICMA_GE_START_3</td>
<td>Set a parameter invalid in a parameter block.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>struct</td>
<td>Print boot structure</td>
</tr>
</tbody>
</table>

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> [initttl <P-3>] [interval <P-4>] [count <P-5>] [size <P-6>] [port <P-7>]`

- **initttl:** 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.2147483</td>
<td>Enter Seconds Between 0 to 2147483. Setting 0 will clear scheduled Reboot if configured.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1.255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1000..10000</td>
<td>Refresh interval in milliseconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot/input</td>
<td>Enter a Digital IO module input in slot/input format.</td>
</tr>
<tr>
<td></td>
<td>MU/input</td>
<td>Enter a Digital IO input on the power supply module in MU/input format.</td>
</tr>
</tbody>
</table>

**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>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot/input</td>
<td>Enter a Digital IO module input in slot/input format.</td>
</tr>
<tr>
<td>MU/input</td>
<td></td>
<td>Enter a Digital IO input on the power supply module in MU/input format.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1000..10000</td>
<td>Refresh interval in milliseconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Retry count for digital outputs.</td>
</tr>
</tbody>
</table>
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

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>

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

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot/output</td>
<td>Enter a Digital IO module output in slot/output format.</td>
</tr>
<tr>
<td></td>
<td>MU/output</td>
<td>Enter a Digital IO output on the power supply module in MU/output format.</td>
</tr>
</tbody>
</table>

### 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>

### no digital-output log-event all
Disable the option
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** no digital-output log-event all

### 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>

### no digital-output snmp-trap all
Disable the option
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** no digital-output snmp-trap all

### no digital-output mirror io
Disable the option
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** no 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot/output</td>
<td>Enter a Digital IO module output in slot/output format.</td>
</tr>
<tr>
<td></td>
<td>MU/output</td>
<td>Enter a Digital IO output on the power supply module in MU/output format.</td>
</tr>
<tr>
<td>P-2</td>
<td>a.b.c.d</td>
<td>a.b.c.d Single IPv4 address.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d:n</td>
<td>a.b.c.d:n IPv4 address with port.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-3</td>
<td>slot/input</td>
<td>Enter a Digital IO module input in slot/input format.</td>
</tr>
<tr>
<td></td>
<td>MU/input</td>
<td>Enter a Digital IO input on the power supply module in MU/input format.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>summary-link</td>
<td>Configure summary links LSDB type optional mode.</td>
</tr>
<tr>
<td></td>
<td>nssa-external-link</td>
<td>Configure nssa external link LSDB type optional mode.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-5</td>
<td>summary-link</td>
<td>Configure summary links LSDB type optional mode.</td>
</tr>
<tr>
<td></td>
<td>nssa-external-link</td>
<td>Configure nssa external link LSDB type optional mode.</td>
</tr>
<tr>
<td>P-6</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-7</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-8</td>
<td>advertise</td>
<td>Set as advertise.</td>
</tr>
<tr>
<td></td>
<td>do-not-advertise</td>
<td>Set as do-not-advertise.</td>
</tr>
<tr>
<td>P-9</td>
<td>summary-link</td>
<td>Configure summary links LSDB type optional mode.</td>
</tr>
<tr>
<td></td>
<td>nssa-external-link</td>
<td>Configure nssa external link LSDB type optional mode.</td>
</tr>
<tr>
<td>P-10</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-11</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-12</td>
<td>0</td>
<td>Configure the TOS (0 is for Normal Service).</td>
</tr>
<tr>
<td>P-13</td>
<td>0</td>
<td>Configure the TOS (0 is for Normal Service).</td>
</tr>
<tr>
<td>P-14</td>
<td>no-area-summary</td>
<td>Disable the router from sending area link state advertisement summaries.</td>
</tr>
<tr>
<td></td>
<td>send-area-summary</td>
<td>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.</td>
</tr>
<tr>
<td>P-15</td>
<td>0..16777215</td>
<td>Configure the default cost.</td>
</tr>
<tr>
<td>P-16</td>
<td>0</td>
<td>Configure the TOS (0 is for Normal Service).</td>
</tr>
<tr>
<td>P-17</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-18</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-19</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-20</td>
<td>none</td>
<td>Configure the authentication type as none (Key and key ID is not required).</td>
</tr>
<tr>
<td></td>
<td>simple</td>
<td>Configure the authentication type as simple (Key ID is not required).</td>
</tr>
<tr>
<td></td>
<td>md5</td>
<td>Configure the authentication type as md5 for the interface.</td>
</tr>
<tr>
<td>P-21</td>
<td>string</td>
<td>&lt;key&gt; Configure the authentication key.</td>
</tr>
<tr>
<td>P-22</td>
<td>0.255</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-23</td>
<td>1..65535</td>
<td>Enter a number between 1 and 65535.</td>
</tr>
<tr>
<td>P-24</td>
<td>1..65535</td>
<td>Enter a number between 1 and 65535.</td>
</tr>
<tr>
<td>P-25</td>
<td>0..3600</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-26</td>
<td>0..3600</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-27</td>
<td>import-nssa</td>
<td>Configure the area as NSSA only.</td>
</tr>
<tr>
<td>P-28</td>
<td>import-external</td>
<td>Change the area to support external LSAs also.</td>
</tr>
<tr>
<td>P-29</td>
<td>always</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>candidate</td>
<td>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.</td>
</tr>
<tr>
<td>P-30</td>
<td>0..65535</td>
<td>Enter a number between 0 and 65535.</td>
</tr>
<tr>
<td>P-31</td>
<td>1..16777214</td>
<td>Configure the metric value.</td>
</tr>
<tr>
<td>P-32</td>
<td>ospf-metric</td>
<td>Set the metric type as ospf Metric.</td>
</tr>
<tr>
<td></td>
<td>comparable-cost</td>
<td>Set the metric type as comparable cost.</td>
</tr>
<tr>
<td></td>
<td>non-comparable</td>
<td>Set the metric type as non-comparable.</td>
</tr>
</tbody>
</table>
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 summary lsa 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

- 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 1583compatibility
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 1583compatibility

- no ip ospf 1583compatibility
  Disable the option
  - Mode: Global Config Mode
  - Privilege Level: Operator
  - Format: no ip ospf 1583compatibility

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.16777214</td>
<td>Configure the default metric for redistributed routes.</td>
</tr>
</tbody>
</table>

- 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-1.2147483647</td>
<td>Configure the external lsdb limit.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.2147483647</td>
<td>Configure the exit overflow interval.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4</td>
<td>Set the maximum path.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.65535</td>
<td>Enter a number between 0 and 65535</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4294967</td>
<td>Configure the auto cost for OSPF calculation.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter the value.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter the value.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter the value.</td>
</tr>
</tbody>
</table>

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 redistribute <P-1> [metric <P-2>] [metric-type <P-3>] [tag <P-4>] [subnets <P-5>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>0..16777214</td>
<td>Configure the metric.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2</td>
<td>Configure the metric type.</td>
</tr>
<tr>
<td>P-4</td>
<td>0..4294967295</td>
<td>Configure the tag.</td>
</tr>
<tr>
<td>P-5</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

- **no ip ospf re-distribute**
  Disable the option

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** `no ip ospf redistribute <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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>out</td>
<td>Configure as out to re-distribute routes with ACL rules</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>broadcast</td>
<td>Configure the link-type as broadcast for the interface. In broadcast networks, routers discover their neighbors dynamically using the OSPF hello protocol.</td>
</tr>
<tr>
<td></td>
<td>nbma</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>point-to-point</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>point-to-multipoint</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.255</td>
<td>Configure the priority.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Enter a number between 1 and 65535</td>
</tr>
</tbody>
</table>

### 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>`
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Enter a number between 1 and 65535</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>Configure the authentication type as none (Key and key ID is not required).</td>
</tr>
<tr>
<td></td>
<td>simple</td>
<td>Configure the authentication type as simple (Key ID is not required).</td>
</tr>
<tr>
<td></td>
<td>md5</td>
<td>Configure the authentication type as md5 for the interface.</td>
</tr>
</tbody>
</table>

### 43.2.12 ip ospf authentication key

Configure authentication key.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `ip ospf authentication key <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;key&gt; Configure the authentication key.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>connected</td>
<td>Select the source protocol as connected.</td>
</tr>
<tr>
<td>static</td>
<td></td>
<td>Select the source protocol as static.</td>
</tr>
<tr>
<td>rip</td>
<td></td>
<td>Select the source protocol as RIP.</td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-15</td>
<td>Enter the metric.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td>1..255</td>
<td>Enter the distance.</td>
</tr>
</tbody>
</table>

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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td>out</td>
<td>Configure as out to re-distribute routes with ACL rules</td>
</tr>
<tr>
<td>&lt;P-2&gt;</td>
<td>connected</td>
<td>Select the source protocol as connected.</td>
</tr>
<tr>
<td></td>
<td>static</td>
<td>Select the source protocol as static.</td>
</tr>
<tr>
<td></td>
<td>ospf</td>
<td>Select the source protocol as OSPF.</td>
</tr>
<tr>
<td>&lt;P-3&gt;</td>
<td>&lt;1000..1099&gt;</td>
<td>Enter the access list number.</td>
</tr>
</tbody>
</table>

**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>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Configure the authentication key.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>Do not send RIP update on this interface.</td>
</tr>
<tr>
<td></td>
<td>ripv1</td>
<td>Configure the send version type as ripv1.</td>
</tr>
<tr>
<td></td>
<td>ripv2</td>
<td>Configure the send version type as ripv2.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>ripv1</td>
<td>Configure the receive version type as ripv1.</td>
</tr>
<tr>
<td></td>
<td>ripv2</td>
<td>Configure the receive version type as ripv2.</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>Configure the receive version type as both.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Do not receive RIP update on this interface.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>ripv1</td>
<td>Configure the receive version type as ripv1.</td>
</tr>
<tr>
<td></td>
<td>ripv2</td>
<td>Configure the receive version type as ripv2.</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>Configure the receive version type as both.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Do not receive RIP update on this interface.</td>
</tr>
</tbody>
</table>
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]

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>connected</td>
<td>Select the source protocol as connected.</td>
</tr>
<tr>
<td></td>
<td>static</td>
<td>Select the source protocol as static.</td>
</tr>
<tr>
<td></td>
<td>ospf</td>
<td>Select the source protocol as OSPF.</td>
</tr>
</tbody>
</table>
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

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

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

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- 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>]
  [priority]: Priority of the virtual router .... default 100

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..254</td>
<td>Enter a priority value.</td>
</tr>
</tbody>
</table>

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>]
  [priority]: Priority of the virtual router

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..254</td>
<td>Enter a priority value.</td>
</tr>
</tbody>
</table>

45.2.3  ip vrrp delete
Delete a VRRP instance.
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
</tbody>
</table>

45.2.4  ip vrrp enable
Enable a VRRP instance.
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
</tbody>
</table>

45.2.5  ip vrrp disable
Disable a VRRP instance.
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..253</td>
<td>Enter the decrement value. The priority will be decremented by the configured value</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Track instance.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..253</td>
<td>Enter the decrement value. The priority will be decremented by the configured value</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Track instance.</td>
</tr>
</tbody>
</table>

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>]]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>Enter a virtual router ID.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

46.1.2 ip arp delete
Delete a static arp entry.
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: ip arp delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

46.1.3 ip arp enable
Enable a static arp entry.
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: ip arp enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

46.1.4 ip arp disable
Disable a static arp entry.
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: ip arp disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>15..21600</td>
<td>Enter the arp response time.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Enter the arp response time.</td>
</tr>
</tbody>
</table>

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>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..10</td>
<td>Enter the arp max retries.</td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, dhcp, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, dhcp, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, dhcp, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, dhcp, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only dhcp, time, winnameserver, tacacs, dns, tftp, netbios-ns and netbios-dgm.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rip</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only <code>dhcp</code>, <code>time</code>, <code>winnameserver</code>, <code>tacacs</code>, <code>dns</code>, <code>isakmp</code>, <code>mobile-ip</code>, <code>tftp</code>, <code>netbios-ns</code> and <code>netbios-dgm</code>.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rp</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Port 0. Relay only <code>dhcp</code>, <code>time</code>, <code>winnameserver</code>, <code>tacacs</code>, <code>dns</code>, <code>isakmp</code>, <code>mobile-ip</code>, <code>tftp</code>, <code>netbios-ns</code> and <code>netbios-dgm</code>.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>dns</td>
<td>Port 67</td>
</tr>
<tr>
<td></td>
<td>isakmp</td>
<td>Port 53</td>
</tr>
<tr>
<td></td>
<td>mobile-ip</td>
<td>Port 500</td>
</tr>
<tr>
<td></td>
<td>winnameserver</td>
<td>Port 434</td>
</tr>
<tr>
<td></td>
<td>netbios-dgm</td>
<td>Port 42</td>
</tr>
<tr>
<td></td>
<td>netbios-ns</td>
<td>Port 138</td>
</tr>
<tr>
<td></td>
<td>ntp</td>
<td>Port 137</td>
</tr>
<tr>
<td></td>
<td>pim-auto-rp</td>
<td>Port 123</td>
</tr>
<tr>
<td></td>
<td>rp</td>
<td>Port 496</td>
</tr>
<tr>
<td></td>
<td>tacacs</td>
<td>Port 520</td>
</tr>
<tr>
<td></td>
<td>tftp</td>
<td>Port 49</td>
</tr>
<tr>
<td></td>
<td>time</td>
<td>Port 69</td>
</tr>
<tr>
<td></td>
<td>&lt;0..65535&gt;</td>
<td>Port 37</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

### 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-5</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-5</td>
<td>active</td>
<td>Activate the option.</td>
</tr>
<tr>
<td></td>
<td>inactive</td>
<td>Inactivate the option.</td>
</tr>
</tbody>
</table>
48.2 clear
Clear several items.

48.2.1 clear ip source-guard bindings
This command clears all dynamic IPSG bindings on all interfaces or on a specific interface.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Operator
- **Format:** `clear ip source-guard bindings [P-1]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

48.3 ip
IP interface commands.

48.3.1 ip source-guard mode
This command configures an interface for IP source guarding (IPSG).
- **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 (IPSG). This option cannot be enabled unless IPSG is enabled. Once it is enabled, it can only be disabled by disabling IPSG 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 (IPSG) 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 IPSG 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>static</td>
<td>Restrict the output based on static bindings.</td>
</tr>
<tr>
<td></td>
<td>dynamic</td>
<td>Restrict the output based on dynamic bindings.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>1,4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

**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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>a.b.c.d.e.f.g.h</td>
<td>IP address and mask e.g. 192.168.1.1-255.255.255.0</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>No network config protocol</td>
</tr>
<tr>
<td></td>
<td>bootp</td>
<td>BOOTP</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>DHCP</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_gateway P-1</td>
</tr>
</tbody>
</table>

Parameter | Value | Meaning
---|-------|-------
P-1 | A.B.C.D | IP address.

51.1.2 network ipv6 operation
Enable or disable the IPv6 feature.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_operation</td>
</tr>
</tbody>
</table>

no network ipv6 operation
Disable the option

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>no_network_ipv6_operation</td>
</tr>
</tbody>
</table>

51.1.3 network ipv6 address delete
Delete a static IPv6 address.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_address_delete P-1 P-2</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_address_enable P-1 P-2</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_address_disable P-1 P-2</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Privileged Exec Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege Level</td>
<td>Operator</td>
</tr>
<tr>
<td>Format</td>
<td>network_ipv6_address_modify P-1 P-2 eui-64 P-3 eui-64: Change the EUI option.</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..128</td>
<td>Prefix</td>
</tr>
<tr>
<td>P-3</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>Disable IPv6 Protocol</td>
</tr>
<tr>
<td></td>
<td>autoconf</td>
<td>Enable SLAAC Protocol.</td>
</tr>
<tr>
<td></td>
<td>dhcpv6</td>
<td>Enable DHCPv6 Protocol.</td>
</tr>
<tr>
<td></td>
<td>all</td>
<td>Enable all IPv6 dynamic protocols.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..5</td>
<td>Range of number of NS packets for DAD</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>4..9000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>4..1800</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>3..1800</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..2147483647</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>b000</td>
<td>Mode IRIG-B000 (BCDtoy, CF, SBS)</td>
</tr>
<tr>
<td></td>
<td>b001</td>
<td>Mode IRIG-B001 (BCDtoy, CF)</td>
</tr>
<tr>
<td></td>
<td>b002</td>
<td>Mode IRIG-B002 (BCDtoy)</td>
</tr>
<tr>
<td></td>
<td>b003</td>
<td>Mode IRIG-B003 (BCDtoy, SBS)</td>
</tr>
<tr>
<td></td>
<td>b004</td>
<td>Mode IRIG-B004 (BCDtoy, BCDyear, CF, SBS)</td>
</tr>
<tr>
<td></td>
<td>b005</td>
<td>Mode IRIG-B005 (BCDtoy, BCDyear, CF)</td>
</tr>
<tr>
<td></td>
<td>b006</td>
<td>Mode IRIG-B006 (BCDtoy, BCDyear)</td>
</tr>
<tr>
<td></td>
<td>b007</td>
<td>Mode IRIG-B007 (BCDtoy, BCDyear, SBS)</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>utc</td>
<td>Transmit UTC.</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>Transmit local time.</td>
</tr>
</tbody>
</table>

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>]

**Parameter** | **Value** | **Meaning**
---|---|---
P-1 | slot no./port no. | 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.
P-2 | single | 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-inband | 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 dedicated control port.
| 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>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.</td>
</tr>
<tr>
<td>P-2</td>
<td>single</td>
<td>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.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td>Select the ring coupling mode for a ring network. Both of the network segments that are coupled are HIPER rings.</td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td>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.</td>
</tr>
<tr>
<td>P-5</td>
<td>ring-only</td>
<td>Select the ring coupling mode for normal redundancy mode. The slave does not respond to a potential failure in the remote ring or network.</td>
</tr>
<tr>
<td>P-6</td>
<td>extended</td>
<td>Select the ring coupling mode for extended redundancy mode. The slave responds to a potential failure in the remote ring or network.</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Default software level of the device</td>
</tr>
<tr>
<td></td>
<td>2S</td>
<td>Software Layer 2 Standard</td>
</tr>
<tr>
<td></td>
<td>2A</td>
<td>Software Layer 2 Advanced</td>
</tr>
<tr>
<td></td>
<td>3S</td>
<td>Software Layer 3 Standard</td>
</tr>
</tbody>
</table>

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 package of the device.

- **Mode**: Command is in all modes available.
- **Privilege Level**: Guest
- **Format**: `show license package [<P-1>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.4294967294</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>0..3600</td>
<td>FailBack time interval.(default: 30)</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 256 characters.</td>
</tr>
</tbody>
</table>

56.2.2 link-backup delete
Delete the associated backup interface.
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: link-backup delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..3600</td>
<td>FailBack time interval.(default: 30)</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Enter a user-defined text, max. 256 characters.</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-5</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5..3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

57.1.5  lldp config chassis tx-delay
Enter the LLDP transmit delay in seconds (tx-delay smaller than \((0.25 \times tx-interval)\))
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** lldp config chassis tx-delay <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8192</td>
<td>Enter a number in the given range (tx-delay smaller than ((0.25 \times tx-interval)))</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..10</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5..32768</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>tx-only</td>
<td>Interface will only transmit LLDP frames. Received frames are not processed.</td>
</tr>
<tr>
<td></td>
<td>rx-only</td>
<td>Interface will only receive LLDP frames. Frames are not transmitted.</td>
</tr>
<tr>
<td></td>
<td>tx-and-rx</td>
<td>Interface will transmit and receive LLDP frames. This is the default setting.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Interface will neither transmit nor process received LLDP frames.</td>
</tr>
</tbody>
</table>

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>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>lldp-only</td>
<td>Collected remote data will be based on received LLDP frames only.</td>
</tr>
<tr>
<td></td>
<td>mac-only</td>
<td>Collected remote data will be based on the switch's FDB entries only.</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>Collected remote data will be based on received LLDP frames as well as on the switch's FDB entries.</td>
</tr>
<tr>
<td></td>
<td>auto-detect</td>
<td>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.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

- **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>
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit</td>
</tr>
</tbody>
</table>

- **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit</td>
</tr>
</tbody>
</table>

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

**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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[cr]</td>
<td>Enable the Bit.</td>
</tr>
</tbody>
</table>

**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
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

57.3.18 lldp tlv igmp
Enable or disable igmp TLV transmission.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** 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

57.3.20 lldp tlv ptp
Enable or disable PTP TLV transmission.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** 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 lldp
Configure of Link Layer Discovery Protocol on a port.

58.1.1 lldp med confignotification
Enable or disable LLDP-MED notification send for this interface.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** \( \text{lldp med confignotification} \)

- **no lldp med confignotification**
  Disable the option
  - **Mode:** Interface Range Mode
  - **Privilege Level:** Operator
  - **Format:** no lldp med confignotification

58.1.2 lldp med transmit-tlv capabilities
Include/Exclude LLDP MED capabilities TLV.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** lldp med transmit-tlv capabilities

- **no lldp med transmit-tlv capabilities**
  Disable the option
  - **Mode:** Interface Range Mode
  - **Privilege Level:** Operator
  - **Format:** no lldp med transmit-tlv capabilities

58.1.3 lldp 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 lldp 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 lldp
Configure of Link Layer Discovery Protocol.

58.2.1 lldp med faststartrepeatcount
Configure LLDP-MED fast start repeat count.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** lldp med faststartrepeatcount <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Enter a value representing the number of LLDP PDUs that will be transmitted. Default is 3.</td>
</tr>
</tbody>
</table>
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]`

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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 80 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>alert</td>
<td>Take immediate action. Potential unrecoverable failure of a component.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Syslog server entry index</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>udp</td>
<td>The UDP-based transmission.</td>
</tr>
<tr>
<td></td>
<td>tls</td>
<td>The TLS-based transmission.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..65535</td>
<td>Port number to be used</td>
</tr>
</tbody>
</table>
59.1.4 logging host delete
Delete a logging host.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** logging host delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Syslog server entry index</td>
</tr>
</tbody>
</table>

59.1.5 logging host enable
Enable a logging host.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** logging host enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Syslog server entry index</td>
</tr>
</tbody>
</table>

59.1.6 logging host disable
Disable a logging host.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** logging host disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Syslog server entry index</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Syslog server entry index</td>
</tr>
<tr>
<td>P-2</td>
<td></td>
<td>IP address</td>
</tr>
<tr>
<td>P-3</td>
<td>udp</td>
<td>The UDP-based transmission.</td>
</tr>
<tr>
<td></td>
<td>tis</td>
<td>The TLS-based transmission.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..65535</td>
<td>Port number to be used</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-5</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>alert</td>
<td>Take immediate action. Potential unrecoverable failure of a component.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

P-6
- **systemlog** the system event log entries
- **audittrail** the audit trail log entries
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1 emergency</td>
<td>System is unusable. System failure has been detected.</td>
<td></td>
</tr>
<tr>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
<td></td>
</tr>
<tr>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
<td></td>
</tr>
<tr>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
<td></td>
</tr>
<tr>
<td>notice</td>
<td>Normal but significant conditions.</td>
<td></td>
</tr>
<tr>
<td>informational</td>
<td>Informational messages.</td>
<td></td>
</tr>
<tr>
<td>debug</td>
<td>Debug-level messages.</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Same as emergency</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Same as alert</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Same as critical</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Same as error</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Same as warning</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Same as notice</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Same as informational</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Same as debug</td>
<td></td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
<td></td>
</tr>
<tr>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
<td></td>
</tr>
<tr>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
<td></td>
</tr>
<tr>
<td>notice</td>
<td>Normal but significant conditions.</td>
<td></td>
</tr>
<tr>
<td>informational</td>
<td>Informational messages.</td>
<td></td>
</tr>
<tr>
<td>debug</td>
<td>Debug-level messages.</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Same as emergency</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Same as alert</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Same as critical</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Same as error</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Same as warning</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Same as notice</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Same as informational</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Same as debug</td>
<td></td>
</tr>
</tbody>
</table>

59.1.13 logging persistent operation

Enable or disable persistent logging. This feature is only available when an ENVM is connected to the device. The logging information is saved on the selected ENVM.

- **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.25</td>
<td>number of logfiles</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.4096</td>
<td>Maximum persistent logfile size on the non-volatile memory in kBytes</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td>P-1</td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td>P-1</td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td>P-1</td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td>P-1</td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td>P-1</td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td>P-1</td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
<tr>
<td>0</td>
<td>Same as emergency</td>
<td>Same as emergency</td>
</tr>
<tr>
<td>1</td>
<td>Same as alert</td>
<td>Same as alert</td>
</tr>
<tr>
<td>2</td>
<td>Same as critical</td>
<td>Same as critical</td>
</tr>
<tr>
<td>3</td>
<td>Same as error</td>
<td>Same as error</td>
</tr>
<tr>
<td>4</td>
<td>Same as warning</td>
<td>Same as warning</td>
</tr>
<tr>
<td>5</td>
<td>Same as notice</td>
<td>Same as notice</td>
</tr>
<tr>
<td>6</td>
<td>Same as informational</td>
<td>Same as informational</td>
</tr>
<tr>
<td>7</td>
<td>Same as debug</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

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>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a valid email address</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>30..1440</td>
<td>Time duration in minutes</td>
</tr>
</tbody>
</table>

59.1.20 logging email severity urgent

Urgent severity level

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** logging email severity urgent <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>alert</td>
<td>Take immediate action. Potential unrecoverable failure of a component.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>alert</td>
<td>Take immediate action. Potential unrecoverable failure of a component.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
[addr]: Create an entry with specified address
[msgtype]: Create an entry with specified 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Destination address entry index</td>
</tr>
</tbody>
</table>

**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>]

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 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>]

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) |

**59.1.26 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>SMTP server index</td>
</tr>
</tbody>
</table>
59.1.27 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>SMTP server index</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>none</td>
<td>Security mode none</td>
</tr>
<tr>
<td></td>
<td>tlv1</td>
<td>Security mode TLSv1</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
<tr>
<td>P-6</td>
<td>1..65535</td>
<td>Port number to be used</td>
</tr>
<tr>
<td>P-7</td>
<td>1..15</td>
<td>SMTP server timeout range</td>
</tr>
<tr>
<td>P-8</td>
<td>string</td>
<td>Enter a user-defined text, max. 1024 characters (allowed characters are from ASCII 32 to 127).</td>
</tr>
</tbody>
</table>

59.1.28 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>urgent</td>
<td>Urgent message type</td>
</tr>
<tr>
<td></td>
<td>non-urgent</td>
<td>Non-urgent message type</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;string&gt; Enter the email subject (Within double quotations if subject includes space)</td>
</tr>
</tbody>
</table>

59.1.29 logging email subject delete
Delete an email subject entry
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: logging email subject delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>urgent</td>
<td>Urgent message type</td>
</tr>
<tr>
<td></td>
<td>non-urgent</td>
<td>Non-urgent message type</td>
</tr>
</tbody>
</table>

59.1.30 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>urgent</td>
<td>Urgent message type</td>
</tr>
<tr>
<td></td>
<td>non-urgent</td>
<td>Non-urgent message type</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;string&gt; Enter the email subject (Within double quotations if subject includes space)</td>
</tr>
</tbody>
</table>

59.1.31 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>urgent</td>
<td>Urgent message type</td>
</tr>
<tr>
<td></td>
<td>non-urgent</td>
<td>Non-urgent message type</td>
</tr>
</tbody>
</table>
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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;filter&gt; Enter a comma separated list of severity ranges, numbers or enum strings are allowed. Example: 0-1,informational-debug</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>Destination address entry index</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>urgent</td>
<td>Urgent message type</td>
</tr>
<tr>
<td></td>
<td>non-urgent</td>
<td>Non-urgent message type</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>SMTP server index</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>
## 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

## 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

## 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

## 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

## 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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

## 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>
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 [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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..10</td>
<td>PDU transmit interval (in seconds).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..50</td>
<td>PDU receive threshold (in frames).</td>
</tr>
</tbody>
</table>

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>
### 60.2.3 loop-protection action
Set loop protection action.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** loop-protection action <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>active</td>
<td>The device will send detection PDUs and process them on reception.</td>
</tr>
<tr>
<td></td>
<td>passive</td>
<td>The device will only process detection PDUs.</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>trap</td>
<td>Send a trap.</td>
</tr>
<tr>
<td></td>
<td>auto-disable</td>
<td>Enable control via Auto-Disable.</td>
</tr>
<tr>
<td></td>
<td>all</td>
<td>Send trap and enable control via Auto-Disable.</td>
</tr>
</tbody>
</table>

### 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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.

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.
P-1 0,4042 Enter the VLAN ID. Entering of ID 0 disables the feature.
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1</td>
<td>Enter PRP instance number (only 1 supported).</td>
</tr>
<tr>
<td>P-2</td>
<td>100</td>
<td>100 MBit/s</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>1000 MBit/s</td>
</tr>
</tbody>
</table>

```
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..2147483647</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

62.2 mac
MAC interface commands.

62.2.1 mac notification operation
Enable or disable MAC notification on this interface.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** mac notification operation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..2147483647</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

62.3 show
Display device options and settings.

62.3.1 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
62.3.2  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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

- **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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>Enter a MAC address.</td>
</tr>
<tr>
<td></td>
<td>1..4042</td>
<td>Enter a VLAN ID.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..160</td>
<td>Idle timeout of a session in minutes (default: 5).</td>
</tr>
</tbody>
</table>

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.

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Pool entry index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..32</td>
<td>Prefix length netmask.</td>
</tr>
<tr>
<td>P-4</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-5</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-6</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-7</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-8</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-9</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-10</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-11</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-12</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Pool entry index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..32</td>
<td>Prefix length netmask.</td>
</tr>
<tr>
<td>P-4</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-5</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-6</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-7</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-8</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-9</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-10</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-11</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-12</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Pool entry index.</td>
</tr>
</tbody>
</table>
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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Pool entry index.</td>
</tr>
</tbody>
</table>

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 |
| 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).
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 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
</tbody>
</table>

65.1.2 network management port
Configure management access per port. Setting to 'all' will allowed access from all ports.

| Mode: | Privileged Exec Mode |
| Mode: | Privileged Exec Mode |
| Privilege Level: | Operator |
| Format: | network management port <P-1> |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>all or slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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. |
| Mode: | Command is in all modes available. |
| Privilege Level: | Guest |
| 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. |
| Mode: | Command is in all modes available. |
| Privilege Level: | Guest |
| 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Enter port number between 1 and 65535</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>Maximum number of concurrent Modbus TCP/IP server sessions (default: 5).</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>0.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>128.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>192.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>224.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>240.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>248.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>252.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>254.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.128.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.192.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.224.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.240.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.248.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.252.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.254.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.128.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.192.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.224.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.240.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.248.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.252.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.254.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.224</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.240</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.248</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.252</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.254</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.255</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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.
Delete a multicast static route instance.

**Mode:** Global Config Mode

**Privilege Level:** Operator

**Format:** `ip mcast staticroute delete <P-1> <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>0.0.0.0</td>
<td>128.0.0.0</td>
</tr>
<tr>
<td></td>
<td>192.0.0.0</td>
<td>224.0.0.0</td>
</tr>
<tr>
<td></td>
<td>240.0.0.0</td>
<td>248.0.0.0</td>
</tr>
<tr>
<td></td>
<td>252.0.0.0</td>
<td>254.0.0.0</td>
</tr>
<tr>
<td></td>
<td>255.0.0.0</td>
<td>255.128.0.0</td>
</tr>
<tr>
<td></td>
<td>255.192.0.0</td>
<td>255.224.0.0</td>
</tr>
<tr>
<td></td>
<td>255.240.0.0</td>
<td>255.248.0.0</td>
</tr>
<tr>
<td></td>
<td>255.252.0.0</td>
<td>255.254.0.0</td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
<td>255.255.128.0</td>
</tr>
<tr>
<td></td>
<td>255.255.192.0</td>
<td>255.255.224.0</td>
</tr>
<tr>
<td></td>
<td>255.255.240.0</td>
<td>255.255.248.0</td>
</tr>
<tr>
<td></td>
<td>255.255.252.0</td>
<td>255.255.254.0</td>
</tr>
<tr>
<td></td>
<td>255.255.255.0</td>
<td>255.255.255.128</td>
</tr>
<tr>
<td></td>
<td>255.255.255.192</td>
<td>255.255.255.224</td>
</tr>
<tr>
<td></td>
<td>255.255.255.240</td>
<td>255.255.255.248</td>
</tr>
<tr>
<td></td>
<td>255.255.255.252</td>
<td>255.255.255.254</td>
</tr>
<tr>
<td></td>
<td>255.255.255.255</td>
<td>255.255.255.255</td>
</tr>
</tbody>
</table>

P-3 enable  Enable the option.

P-3 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>`
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

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>

### no ip mcast boundary
Disable the option
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** no ip mcast boundary <P-1> <P-2>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]]
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>]]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter the MRM priority (default: 32768).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>client</td>
<td>The device will be in the role of a ring client (MRC).</td>
</tr>
<tr>
<td></td>
<td>manager</td>
<td>The device will be in the role of a ring manager (MRM).</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

Parameter Value Meaning
P-1 enable Enable the option.
disable Disable the option.
### 68.1.7 \texttt{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>]`

  
  \[ \text{[fixed-backup]}: \text{Enable or disable the secondary ring port of the manager to be the backup port permanently.} \]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

### 68.1.8 \texttt{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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>500ms</td>
<td>Maximum recovery delay of 500ms in the MRP domain.</td>
</tr>
<tr>
<td></td>
<td>200ms</td>
<td>Maximum recovery delay of 200ms in the MRP domain.</td>
</tr>
<tr>
<td></td>
<td>30ms</td>
<td>Maximum recovery delay of 30ms in the MRP domain.</td>
</tr>
<tr>
<td></td>
<td>10ms</td>
<td>Maximum recovery delay of 10ms in the MRP domain.</td>
</tr>
</tbody>
</table>

### 68.1.9 \texttt{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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>reset</td>
<td>Reset the round-trip-delay counters.</td>
</tr>
</tbody>
</table>

### 68.1.10 \texttt{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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4042</td>
<td>VLAN identifier of the MRP domain. (VLAN ID 0 means that no VLAN is used).</td>
</tr>
</tbody>
</table>

### 68.1.11 \texttt{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 \texttt{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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td><code>&lt;domain id&gt;</code> 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).</td>
</tr>
</tbody>
</table>

### 68.1.13 \texttt{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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>10..100</td>
<td>Join time-interval in centiseconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>20..600</td>
<td>Leave time-interval in centiseconds.</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>200..6000</td>
<td>Leave-All time-interval in centiseconds.</td>
</tr>
</tbody>
</table>

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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

**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<>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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<>]
### 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

### 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

### 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..52</td>
<td>The number of the max fan-in ports (default: 12)</td>
</tr>
</tbody>
</table>

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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

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 Time Protocol (NTP)

#### 73.1 ntp

Configure NTP settings.

##### 73.1.1 ntp client operation

Enable or disable the NTP client.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ntp client operation <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

##### 73.1.2 ntp client operating-mode

Set the NTP client operating mode.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ntp client operating-mode <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>unicast</td>
<td>Enable NTP client in unicast operating mode.</td>
</tr>
<tr>
<td></td>
<td>broadcast</td>
<td>Enable NTP client in broadcast operating mode.</td>
</tr>
</tbody>
</table>

##### 73.1.3 ntp server operation

Enable or disable the NTP server.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ntp server operation <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

##### 73.1.4 ntp server operating-mode

Set the NTP server operating mode.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ntp server operating-mode <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>symmetric</td>
<td>Enable NTP server in symmetric operating mode.</td>
</tr>
<tr>
<td></td>
<td>client-server</td>
<td>Enable NTP server in client-server operating mode.</td>
</tr>
</tbody>
</table>

##### 73.1.5 ntp server localclock-stratum

Set the stratum of the localclock.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ntp server localclock-stratum <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..16</td>
<td>Localclock stratum.</td>
</tr>
</tbody>
</table>

##### 73.1.6 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).
73.1.7  ntp peers delete
Delete a peer.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ntp peers delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>NTP servers index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-4</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
<tr>
<td>P-5</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

73.2  show
Display device options and settings.

73.2.1  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

73.2.2  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
74 OPC/UA Server (IEC62541)

74.1 opc-ua
Configure IEC62541 - OPC/UA server settings.

74.1.1 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

74.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Enter port number between 1 and 65535</td>
</tr>
</tbody>
</table>

74.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

74.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>Set no security policy.</td>
</tr>
<tr>
<td></td>
<td>basic128rsa15</td>
<td>Set security policy as basic128Rsa15.</td>
</tr>
<tr>
<td></td>
<td>basic256</td>
<td>Set security policy as basic256.</td>
</tr>
<tr>
<td></td>
<td>basic256sha256</td>
<td>Set security policy as basic256Sha256.</td>
</tr>
</tbody>
</table>

74.1.5 opc-ua users add
Add a new user.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: opc-ua users add <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name.</td>
</tr>
</tbody>
</table>

74.1.6 opc-ua users delete
Delete an existing user.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: opc-ua users delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name.</td>
</tr>
</tbody>
</table>
74.1.7 opc-ua users enable

Enable user.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** opc-ua users enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name.</td>
</tr>
</tbody>
</table>

74.1.8 opc-ua users disable

Disable user.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** opc-ua users disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name.</td>
</tr>
</tbody>
</table>

74.1.9 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>read-only</td>
<td>Set access role as read-only.</td>
</tr>
</tbody>
</table>

74.2 show

Display device options and settings.

74.2.1 show opc-ua global

IEC62541 - OPC/UA server settings.

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

74.2.2 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
75 Out-of-band Management

75.1 network
Configure the inband and outband connectivity.

75.1.1 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

75.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>No out-of-band config protocol.</td>
</tr>
<tr>
<td></td>
<td>dhcp</td>
<td>DHCP</td>
</tr>
</tbody>
</table>

75.1.3 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

75.1.4 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

75.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
75.2 show
Display device options and settings.

75.2.1 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

75.2.2 show network usb
Show USB out-of-band management configuration.
▶ Mode: Command is in all modes available.
▶ Privilege Level: Guest
▶ Format: show network usb
76 Packet Filter

76.1 packet-filter
Creation and configuration of Firewall rules.

76.1.1 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 |

76.1.2 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> |

76.1.3 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 |

76.1.4 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> [description <P-9>] |
| [description]: Rule description/name for the L3 firewall rule |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>accept</td>
<td>Accept packets</td>
</tr>
<tr>
<td></td>
<td>drop</td>
<td>Drop packets without notification</td>
</tr>
<tr>
<td></td>
<td>reject</td>
<td>Drop packets and notify source</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Source IP address/CIDR mask/'any'</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Source port/port list with comma/port range with hyphen/'any'</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Target IP address/CIDR mask/'any'</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Target port/port list with comma/port range with hyphen/'any'</td>
</tr>
<tr>
<td>P-6</td>
<td>icmp</td>
<td>Internet Control Message Protocol</td>
</tr>
<tr>
<td></td>
<td>igmp</td>
<td>Internet Group Management Protocol</td>
</tr>
<tr>
<td></td>
<td>ipip</td>
<td>IP-within-IP Encapsulation Protocol</td>
</tr>
<tr>
<td></td>
<td>tcp</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td></td>
<td>udp</td>
<td>User Datagram Protocol</td>
</tr>
<tr>
<td></td>
<td>esp</td>
<td>Encapsulating Security Protocol</td>
</tr>
<tr>
<td></td>
<td>ah</td>
<td>Authentication Header</td>
</tr>
<tr>
<td></td>
<td>any</td>
<td>Any of the above</td>
</tr>
<tr>
<td>P-7</td>
<td>string</td>
<td>Parameters for rule (or 'none')</td>
</tr>
</tbody>
</table>
76.1.5 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> [description <P-9>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Source IP address/CIDR mask/'any'</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Source port/port list with comma/port range with hyphen/'any'</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Target IP address/CIDR mask/'any'</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Target port/port list with comma/port range with hyphen/'any'</td>
</tr>
<tr>
<td>P-6</td>
<td>icmp</td>
<td>Internet Control Message Protocol</td>
</tr>
<tr>
<td></td>
<td>igmp</td>
<td>Internet Group Management Protocol</td>
</tr>
<tr>
<td></td>
<td>ipip</td>
<td>IP-within-IP Encapsulation Protocol</td>
</tr>
<tr>
<td></td>
<td>tcp</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td></td>
<td>udp</td>
<td>User Datagram Protocol</td>
</tr>
<tr>
<td></td>
<td>esp</td>
<td>Encapsulating Security Protocol</td>
</tr>
<tr>
<td></td>
<td>ah</td>
<td>Authentication Header</td>
</tr>
<tr>
<td></td>
<td>any</td>
<td>Any of the above</td>
</tr>
<tr>
<td>P-7</td>
<td>string</td>
<td>Parameters for rule (or 'none')</td>
</tr>
<tr>
<td>P-8</td>
<td>accept</td>
<td>Accept packets</td>
</tr>
<tr>
<td></td>
<td>drop</td>
<td>Drop packets without notification</td>
</tr>
<tr>
<td></td>
<td>reject</td>
<td>Drop packets and notify source</td>
</tr>
<tr>
<td></td>
<td>enforce-modbus</td>
<td>Accept or drop packets by Modbus TCP/IP enforcer, protocol should be tcp or udp</td>
</tr>
<tr>
<td></td>
<td>enforce-opc</td>
<td>Accept or drop packets by opc enforcer, protocol should be tcp</td>
</tr>
<tr>
<td></td>
<td>enforce-iec104</td>
<td>Accept or drop packets by IEC104 enforcer, protocol should be tcp</td>
</tr>
<tr>
<td></td>
<td>enforce-dnp3</td>
<td>Accept or drop packets by DNP3 enforcer, protocol should be tcp</td>
</tr>
<tr>
<td>P-9</td>
<td>string</td>
<td>Rule description/name</td>
</tr>
</tbody>
</table>

76.1.6 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>

76.1.7 packet-filter l3 enablerule

Enables a rule from L3 rule table. A rule can only be activated when all required parameters are set and at least one interface is mapped to the rule. You cannot activate a rule if an enforcer mappings to an inactive profile.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** packet-filter l3 enablerule <P-1>

76.1.8 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>
### 76.1.9 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
<tr>
<td>P-2</td>
<td>log</td>
<td>Log when rule is applied</td>
</tr>
<tr>
<td></td>
<td>trap</td>
<td>Send trap when rule is applied</td>
</tr>
<tr>
<td></td>
<td>logtrap</td>
<td>Log and send trap when rule is applied</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Disable log and trap</td>
</tr>
</tbody>
</table>

### 76.1.10 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td>P-2</td>
<td>ingress</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td></td>
<td>egress</td>
<td>Rule applies on egress direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
<tr>
<td>P-4</td>
<td>0..4294967295</td>
<td>Priority</td>
</tr>
</tbody>
</table>

### 76.1.11 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td>P-2</td>
<td>ingress</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td></td>
<td>egress</td>
<td>Rule applies on egress direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
</tbody>
</table>

### 76.1.12 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td>P-2</td>
<td>ingress</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td></td>
<td>egress</td>
<td>Rule applies on egress direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
</tbody>
</table>

### 76.1.13 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td>P-2</td>
<td>ingress</td>
<td>Rule applies on ingress direction.</td>
</tr>
<tr>
<td></td>
<td>egress</td>
<td>Rule applies on egress direction.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2048</td>
<td>Rule index</td>
</tr>
</tbody>
</table>
76.2 **clear**
Clear several items.

76.2.1 **clear fw-state-table**
Clear Firewall connection tracking table.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** `clear fw-state-table`

76.3 **show**
Display device options and settings.

76.3.1 **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`

76.3.2 **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`

76.3.3 **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`

76.3.4 **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`

76.3.5 **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`

76.3.6 **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`
77 Private VLAN

77.1 private-vlan

VLAN to be configured as private VLAN.

77.1.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>primary</td>
<td>Set the vlan type as primary.</td>
</tr>
<tr>
<td></td>
<td>isolated</td>
<td>Set the vlan type as isolated.</td>
</tr>
<tr>
<td></td>
<td>community</td>
<td>Set the vlan type as community.</td>
</tr>
<tr>
<td></td>
<td>unconfigured</td>
<td>Set the vlan type as unconfigured.</td>
</tr>
</tbody>
</table>

77.1.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Comma Separated Existing Secondary VLAN/VLANs.</td>
</tr>
</tbody>
</table>

77.1.3 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Comma Separated Existing Secondary VLAN/VLANs.</td>
</tr>
</tbody>
</table>

77.2 switchport

Set the switchport status of a port.

77.2.1 switchport mode private-vlan

Configuration for Private VLAN

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** switchport mode private-vlan <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>general</td>
<td>Set the port mode as General.</td>
</tr>
<tr>
<td></td>
<td>host</td>
<td>Set the port mode as Host.</td>
</tr>
<tr>
<td></td>
<td>promiscuous</td>
<td>Set the port mode as Promiscuous.</td>
</tr>
</tbody>
</table>

77.2.2 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td></td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

**77.2.3 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 separated secondary VLANs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td></td>
<td>Comma Separated Existing Secondary VLAN/VLANs.</td>
</tr>
</tbody>
</table>

**77.2.4 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

**77.2.5 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 separated secondary VLANs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Comma Separated Existing Secondary VLAN/VLANs.</td>
</tr>
</tbody>
</table>

**77.3 show**

Display device options and settings.

**77.3.1 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
78 Protocol Based VLAN

78.1 vlan
Creation and configuration of VLANS.

78.1.1 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.
nvlan-id: Associate a VLAN ID to a group.
ethertype: Add protocols to an existing group. Before adding protocols to a group please create one.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANS group index.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter 0 to 16 alpha numerical characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>&lt;protocol-list&gt; 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.</td>
</tr>
</tbody>
</table>

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>

78.1.2 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 ethertypes from a protocol group.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANS group index.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter 0 to 16 alpha numerical characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>&lt;protocol-list&gt; 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.</td>
</tr>
</tbody>
</table>

78.1.3 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 ethertypes from a protocol group.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANS group index.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>&lt;protocol-list&gt; 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.</td>
</tr>
</tbody>
</table>

78.2 vlan
Configure 802.1Q port parameters for VLANS.
78.2.1  **vlan protocol group add**
Add this interface to a group.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan protocol group add <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANs group index.</td>
</tr>
</tbody>
</table>

78.2.2  **vlan protocol group delete**
Remove this interface from a group.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan protocol group delete <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANs group index.</td>
</tr>
</tbody>
</table>

78.3  **show**
Display device options and settings.

78.3.1  **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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..128</td>
<td>Protocol based VLANs group index.</td>
</tr>
</tbody>
</table>
79 Protocol Independent Multicast (PIM)

79.1 ip
Set IP parameters.

79.1.1 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

79.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>60..64800</td>
<td>Enter the holdtimes value (default: 210).</td>
</tr>
</tbody>
</table>

79.1.3 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

79.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
79.1.5  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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
79.1.6  *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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>0.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>128.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>192.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>224.0.0.0</td>
<td></td>
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<tr>
<td></td>
<td>240.0.0.0</td>
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<tr>
<td></td>
<td>248.0.0.0</td>
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<tr>
<td></td>
<td>252.0.0.0</td>
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<tr>
<td></td>
<td>254.0.0.0</td>
<td></td>
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<td>255.0.0.0</td>
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<td></td>
<td>255.128.0.0</td>
<td></td>
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<tr>
<td></td>
<td>255.192.0.0</td>
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<td></td>
<td>255.224.0.0</td>
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<td></td>
<td>255.240.0.0</td>
<td></td>
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<tr>
<td></td>
<td>255.248.0.0</td>
<td></td>
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<tr>
<td></td>
<td>255.252.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.254.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
<td></td>
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<tr>
<td></td>
<td>255.255.128.0</td>
<td></td>
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<tr>
<td></td>
<td>255.255.192.0</td>
<td></td>
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<tr>
<td></td>
<td>255.255.224.0</td>
<td></td>
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<td></td>
<td>255.255.240.0</td>
<td></td>
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<tr>
<td></td>
<td>255.255.248.0</td>
<td></td>
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<tr>
<td></td>
<td>255.255.252.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.254.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.224</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.240</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.248</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.252</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.254</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255.255</td>
<td></td>
</tr>
</tbody>
</table>
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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
79.1.8 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>0.0.0.0</td>
<td>IP address</td>
</tr>
<tr>
<td></td>
<td>128.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>192.0.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>224.0.0.0</td>
<td></td>
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<tr>
<td></td>
<td>240.0.0.0</td>
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<td>252.0.0.0</td>
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<td></td>
<td>254.0.0.0</td>
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<td></td>
<td>255.0.0.0</td>
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<tr>
<td></td>
<td>255.128.0.0</td>
<td></td>
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<td></td>
<td>255.192.0.0</td>
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<td>255.224.0.0</td>
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<td>255.240.0.0</td>
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<td>255.248.0.0</td>
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<tr>
<td></td>
<td>255.255.0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.224</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.240</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.248</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.252</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.254</td>
<td></td>
</tr>
<tr>
<td></td>
<td>255.255.255</td>
<td></td>
</tr>
</tbody>
</table>
79.1.9  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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>true</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>false</td>
<td>False</td>
</tr>
</tbody>
</table>

**Parameter** | **Value** | **Meaning**
--- | --- | ---
P-1 | A.B.C.D | IP address.
79.1.10 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>0.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>128.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>192.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>224.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>240.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>248.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>252.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>254.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.0.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.128.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.192.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.224.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.240.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.248.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.252.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.254.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.255.0.0</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>255.255.128.0</td>
<td></td>
</tr>
<tr>
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### 79.1.11 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>`

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<tr>
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<th>Meaning</th>
</tr>
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<tbody>
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<td>IP address.</td>
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79.1.12 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>`

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<th>Value</th>
<th>Meaning</th>
</tr>
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<tbody>
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<td>P-2</td>
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79.1.13 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>`

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<th>Meaning</th>
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<td>A.B.C.D</td>
<td>IP address.</td>
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<table>
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<tr>
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<th>Value</th>
<th>Meaning</th>
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79.1.14 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>`

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<th>Meaning</th>
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</thead>
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<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
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</table>
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>`

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<tr>
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<th>Meaning</th>
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</tr>
<tr>
<td></td>
<td>255.255.255.192</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.224</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.240</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.248</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.252</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.254</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.255</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
79.1.16 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-3</td>
<td>0.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>128.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>192.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>224.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>240.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>248.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>252.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>254.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.0.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.128.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.192.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.224.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.240.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.248.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.252.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.254.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.128.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.192.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.224.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.240.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.248.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.252.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.254.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.0</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.128</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.192</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.224</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.240</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.248</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.252</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.254</td>
<td>IP address.</td>
</tr>
<tr>
<td></td>
<td>255.255.255.255</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
### 79.1.17 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4294967295</td>
<td>Enter the zone index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>0.128</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..16383</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-5</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 79.1.18 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4294967295</td>
<td>Enter the zone index.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>0.128</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
79.1.19 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4294967295</td>
<td>Enter the zone index.</td>
</tr>
</tbody>
</table>

79.1.20 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4294967295</td>
<td>Enter the zone index.</td>
</tr>
</tbody>
</table>

79.1.21 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4294967295</td>
<td>Enter the zone index.</td>
</tr>
</tbody>
</table>

79.1.22 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

79.2 ip
IP interface commands.

79.2.1 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
79.2.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..18000</td>
<td>Enter the hello interval (default: 30).</td>
</tr>
</tbody>
</table>

79.2.3 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

79.2.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4294967294</td>
<td>Enter the designated router priority (default: 1).</td>
</tr>
</tbody>
</table>

79.2.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..18000</td>
<td>Enter the join-prune interval (default: 30).</td>
</tr>
</tbody>
</table>

79.3 show
Display device options and settings.

79.3.1 show ip pim global
Display the PIM global configuration.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip pim global

79.3.2 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

79.3.3 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]
### 79.3.4 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 79.3.5 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>fixed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>static</td>
<td></td>
</tr>
<tr>
<td></td>
<td>config-ssm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bsr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>auto-rp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>embedded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>static-override</td>
<td></td>
</tr>
</tbody>
</table>

### 79.3.6 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

### 79.3.7 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

### 79.3.8 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

### 79.3.9 show ip pim ssm
Display the information regarding SSM.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip pim ssm

### 79.3.10 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

Parameter value: Value: Meaning:
- P-1: slot no./port no.
- P-1: fixed
- P-1: static
- P-1: config-ssm
- P-1: bsr
- P-1: auto-rp
- P-1: embedded
- P-1: static-override
- P-1: A.B.C.D: IP address.
80 Power Over Ethernet (PoE)

80.1 inlinepower
Configure the global inline power settings.

80.1.1 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

80.1.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>0..65507</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..99</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

no inlinepower slot
Disable the option
➤ Mode: Global Config Mode
➤ Privilege Level: Operator
➤ Format: no inlinepower slot budget threshold trap

80.1.3 inlinepower threshold
Configure the global inline power notification (trap) threshold.
➤ Mode: Global Config Mode
➤ Privilege Level: Operator
➤ Format: inlinepower threshold <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..99</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

80.1.4 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
80.2 inlinepower

Configure inline power interface settings.

80.2.1 inlinepower allowed-classes add

Add the class to this interface.
► Mode: Interface Range Mode
► Privilege Level: Operator
► Format: inlinepower allowed-classes add <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>Class 0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Class 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Class 2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Class 3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Class 4</td>
</tr>
</tbody>
</table>

80.2.2 inlinepower allowed-classes delete

Remove the class from this interface.
► Mode: Interface Range Mode
► Privilege Level: Operator
► Format: inlinepower allowed-classes delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>Class 0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Class 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Class 2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Class 3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Class 4</td>
</tr>
</tbody>
</table>

80.2.3 inlinepower auto-shutdown-end

Configure the interface-related inline power autoshtutdown end time.
► Mode: Interface Range Mode
► Privilege Level: Operator
► Format: inlinepower auto-shutdown-end <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter 5 alpha numerical characters (format 00:00).</td>
</tr>
</tbody>
</table>

80.2.4 inlinepower auto-shutdown-start

Configure the interface-related inline power autoshtutdown start time.
► Mode: Interface Range Mode
► Privilege Level: Operator
► Format: inlinepower auto-shutdown-start <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter 5 alpha numerical characters (format 00:00).</td>
</tr>
</tbody>
</table>

80.2.5 inlinepower auto-shutdown-timer

Configure the interface-related inline power autoshtutdown 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

80.2.6 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
**80.2.7 inlinepower name**

Configure the interface-related inline power interface name.

- **Mode**: Interface Range Mode
- **Privilege Level**: Operator
- **Format**: `inlinepower name <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

**80.2.8 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>crit.</td>
<td>Set this interfaces' inline power priority to critical (highest).</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>Set this interfaces' inline power priority to high.</td>
</tr>
<tr>
<td></td>
<td>low</td>
<td>Set this interfaces' inline power priority to low. This is the default setting.</td>
</tr>
</tbody>
</table>

**80.2.9 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`

**80.2.10 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.000..30.000</td>
<td>PoE power limit in watts (e.g. 12.54).</td>
</tr>
</tbody>
</table>

**80.3 show**

Display device options and settings.

- **80.3.1 show inlinepower global**
  Display the inline power global settings.
  - **Mode**: Command is in all modes available.
  - **Privilege Level**: Guest
  - **Format**: `show inlinepower global`
80.3.2 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

80.3.3 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
81 Port Monitor

81.1 port-monitor
Configure the Port Monitor condition settings.

81.1.1 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

81.2 port-monitor
Configure the Port Monitor condition settings.

81.2.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5..180</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

81.2.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1000000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

81.2.3 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

81.2.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..180</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
81.2.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..100</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

81.2.6 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

81.2.7 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

81.2.8 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>all</td>
<td>All packets.</td>
</tr>
<tr>
<td></td>
<td>bc</td>
<td>Broadcast packets.</td>
</tr>
<tr>
<td></td>
<td>bc-mc</td>
<td>Broadcast and multicast packets.</td>
</tr>
</tbody>
</table>

81.2.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>pps</td>
<td>Packets per second.</td>
</tr>
<tr>
<td></td>
<td>kbps</td>
<td>Kilobits per second.</td>
</tr>
</tbody>
</table>

81.2.10 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..10000000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
81.2.11 **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..1000000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

81.2.12 **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..20</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

81.2.13 **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

81.2.14 **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

81.2.15 **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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>[hdx10]</td>
<td>10 Mbit/s - half duplex</td>
</tr>
<tr>
<td>P-2</td>
<td>[fdx10]</td>
<td>10 Mbit/s - full duplex</td>
</tr>
<tr>
<td>P-3</td>
<td>[hdx100]</td>
<td>100 Mbit/s - half duplex</td>
</tr>
<tr>
<td>P-4</td>
<td>[fdx100]</td>
<td>100 Mbit/s - full duplex</td>
</tr>
<tr>
<td>P-5</td>
<td>[fdx-1000]</td>
<td>1000 Mbit/s - full duplex</td>
</tr>
<tr>
<td>P-6</td>
<td>[fdx-2500]</td>
<td>2500 Mbit/s - full duplex</td>
</tr>
<tr>
<td>P-7</td>
<td>[fdx-100000]</td>
<td>1000 Mbit/s - full duplex</td>
</tr>
</tbody>
</table>

81.2.16 **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
81.2.17 port-monitor action
Enable or disable interface on port condition.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `port-monitor action <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>port-disable</td>
<td>Disable interface on port condition.</td>
</tr>
<tr>
<td></td>
<td>trap-only</td>
<td>Send only a trap.</td>
</tr>
<tr>
<td></td>
<td>auto-disable</td>
<td>Enable or disable interface on port condition by AUTODIS.</td>
</tr>
</tbody>
</table>

81.2.18 port-monitor reset
Reset the port monitor.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `port-monitor reset [<P-1>]`

- **no port-monitor reset**
  Disable the option
  - **Mode:** Interface Range Mode
  - **Privilege Level:** Operator
  - **Format:** `no port-monitor reset [<P-1>]`

81.3 show
Display device options and settings.

81.3.1 show port-monitor operation
Display the Port Monitor operation.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show port-monitor operation`

81.3.2 show port-monitor brief
Display the Port Monitor summary.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show port-monitor brief`

81.3.3 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`

81.3.4 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

81.3.5 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]`
### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
82 Port Security

82.1 port-security

Port security

82.1.1 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

82.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>mac-based</td>
<td>Port security is based on given, allowed source MAC addresses.</td>
</tr>
<tr>
<td></td>
<td>ip-based</td>
<td>Port security is based on given, allowed source IP addresses.</td>
</tr>
</tbody>
</table>

no port-security mode

Disable the option

Mode: Global Config Mode
Privilege Level: Operator
Format: no port-security mode <P-1>

82.2 port-security

Port security

82.2.1 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

82.2.2 port-security max-dynamic

Set dynamic limit for the interface.

Mode: Interface Range Mode
Privilege Level: Operator
Format: port-security max-dynamic <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.600</td>
<td>Maximum number of dynamically locked MAC addresses.</td>
</tr>
</tbody>
</table>
82.2.3  **port-security max-static**
Set static limit for the interface.
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: `port-security max-static <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..64</td>
<td>Maximum number of statically locked addresses.</td>
</tr>
</tbody>
</table>

82.2.4  **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>VLAN ID</td>
</tr>
</tbody>
</table>

82.2.5  **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`

82.2.6  **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>aa:bb:cc:dd:ee:ff</td>
<td>MAC address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>VLAN ID</td>
</tr>
</tbody>
</table>

82.2.7  **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>VLAN ID</td>
</tr>
</tbody>
</table>

82.2.8  **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..4042</td>
<td>VLAN ID</td>
</tr>
</tbody>
</table>

82.2.9  **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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..3600</td>
<td>time in seconds</td>
</tr>
</tbody>
</table>
82.3  show

Display device options and settings.

82.3.1  show port-security global

Display the port security global status.

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

82.3.2  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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

82.3.3  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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

82.3.4  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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

82.3.5  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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
83  Profinet IO

83.1  profinet
Configures the PROFINET functionality on this device.

83.1.1  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

83.1.2  profinet name-of-station
Sets the name of the station.
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: profinet name-of-station <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the name of the station, alphanumeric ascii string, max. 240 characters.</td>
</tr>
</tbody>
</table>

83.2  profinet
Configures the PROFINET functionality on this device.

83.2.1  profinet dcp-mode
Sets the PROFINET DCP mode on an interface.
► Mode: Interface Range Mode
► Privilege Level: Operator
► Format: profinet dcp-mode <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>none</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>ingress</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>egress</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>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.</td>
</tr>
</tbody>
</table>

83.3  copy
Copy different kinds of items.
83.3.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

83.3.2 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

83.4 show
Display device options and settings.

83.4.1 show profinet global
Display the PROFINET global settings.
   ▶ Mode: Command is in all modes available.
   ▶ Privilege Level: Guest
   ▶ Format: show profinet global

83.4.2 show profinet port
Display the port-related PROFINET settings.
   ▶ Mode: Command is in all modes available.
   ▶ Privilege Level: Guest
   ▶ Format: show profinet port
# 84 Precision Time Protocol (PTP)

## 84.1 ptp

Enable or disable the Precision Time Protocol (IEEE 1588-2008).

### 84.1.1 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`

### 84.1.2 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>v2-boundary-clock</td>
<td>Specifies V2 boundary clock as mode for the local clock.</td>
</tr>
<tr>
<td></td>
<td>v2-transparent-clock</td>
<td>Specifies V2 transparent clock as mode for the local clock.</td>
</tr>
</tbody>
</table>

### 84.1.3 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..999999999</td>
<td></td>
</tr>
</tbody>
</table>

### 84.1.4 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>31..1000000000</td>
<td></td>
</tr>
</tbody>
</table>

### 84.1.5 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`
84.1.6  **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

84.1.7  **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>ieee802.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>udp-ipv4</td>
<td></td>
</tr>
</tbody>
</table>

84.1.8  **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

84.1.9  **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

84.1.10  **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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>e2e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p2p</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e2e-optimized</td>
<td></td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td></td>
</tr>
</tbody>
</table>

84.1.11  **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>
### 84.1.12 ptp v2-transparent-clock vlan

VLAN in which PTP packets are send. With a value of none all packets are send untagged.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-transparent-clock vlan <P-1>`

### 84.1.13 ptp v2-transparent-clock vlan-priority

VLAN priority of tagged ptp packets.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>vlanId</td>
<td>Send ptp to vlanId Use 0 for priority only tagged frames</td>
</tr>
<tr>
<td>P-1</td>
<td>none</td>
<td>Send all ptp packets untagged</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-transparent-clock vlan-priority <P-1>`

### 84.1.14 ptp v2-boundary-clock domain

Configure the PTP domain number (0..255)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-boundary-clock domain <P-1>`

### 84.1.15 ptp v2-boundary-clock priority1

Configure the priority1 value (0..255) for the BMCA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-boundary-clock priority1 <P-1>`

### 84.1.16 ptp v2-boundary-clock priority2

Configure the priority2 value (0..255) for the BMCA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-boundary-clock priority2 <P-1>`

### 84.1.17 ptp v2-boundary-clock utc-offset

Configure the current UTC offset (TAI - UTC) in seconds.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-32768..32767</td>
<td></td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-boundary-clock utc-offset <P-1>`

### 84.1.18 ptp v2-boundary-clock utc-offset-valid

Configure the UTC offset valid flag

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>true</td>
<td>True</td>
</tr>
<tr>
<td>P-1</td>
<td>false</td>
<td>False</td>
</tr>
</tbody>
</table>

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ptp v2-boundary-clock utc-offset-valid <P-1>`
84.2 ptp

Enable or disable the Precision Time Protocol (IEEE 1588-2008) on a port.

84.2.1 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`

84.2.2 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-</td>
<td>2000000000..200000000000</td>
</tr>
</tbody>
</table>

84.2.3 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>32</td>
</tr>
</tbody>
</table>

84.2.4 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`

84.2.5 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>`
84.2.5 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

84.2.6 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

84.2.7 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

84.2.8 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2.10</td>
<td></td>
</tr>
</tbody>
</table>

84.2.9 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000000000..2000000000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0000</td>
<td></td>
</tr>
</tbody>
</table>

84.2.10 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>auto</td>
<td></td>
</tr>
</tbody>
</table>
84.2.11 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>e2e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p2p</td>
<td></td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td></td>
</tr>
</tbody>
</table>

84.2.12 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>ieee802.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>udp-ipv4</td>
<td></td>
</tr>
</tbody>
</table>

84.2.13 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td></td>
</tr>
</tbody>
</table>

84.2.14 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>vlanId</td>
<td>Send ptp to vlanId Use 0 for priority only tagged frames</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Send all ptp packets untagged</td>
</tr>
</tbody>
</table>

84.3 show
Display device options and settings.

84.3.1 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.
85 Password Management

85.1 passwords
Manage password policies and options.

85.1.1 passwords min-length
Set minimum password length for user passwords.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** passwords min-length <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..5</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..16</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..16</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..16</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..16</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

85.1.7 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>
85.2  **show**  
Display device options and settings.

85.2.1  **show passwords**  
Display the password policies and options.  
- **Mode:** Command is in all modes available.  
- **Privilege Level:** Administrator  
- **Format:** `show passwords`  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>&lt;0&gt;</td>
<td>Disables the counting.</td>
</tr>
<tr>
<td></td>
<td>&lt;1..60&gt;</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
86  Radius

86.1  authorization
Configure authorization parameters.

86.1.1  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

86.2  radius
Configure RADIUS parameters.

86.2.1  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

86.2.2  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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

86.2.3  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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Next RADIUS server valid index (it can be seen with '#show radius global' command).</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..65535</td>
<td>Enter port number between 1 and 65535</td>
</tr>
</tbody>
</table>
86.2.4  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.

86.2.5  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>]
[<P-1>]: RADIUS accounting server name.
[<P-2>]: RADIUS accounting server port (default: 1813).
[<P-3>]: Enable or disable a RADIUS accounting server entry.
[<P-4>]: Configure the shared secret for the RADIUS accounting server.
[<P-5>]: 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.

86.2.6  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.
[<P-1>]: RADIUS authentication server name.
[<P-2>]: 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

86.2.7  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.

86.2.8  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>]
[<P-1>]: RADIUS authentication server name.
[<P-2>]: 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.
86.2.9 radius server retransmit
Configure the retransmit value for the RADIUS server.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** radius server retransmit <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>RADIUS server index.</td>
</tr>
</tbody>
</table>

86.2.10 radius server timeout
Configure the RADIUS server timeout value.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** radius server timeout <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..30</td>
<td>Timeout in seconds (default: 5).</td>
</tr>
</tbody>
</table>

86.2.11 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

86.3 show
Display device options and settings.

86.3.1 show radius global
Display the global RADIUS configuration.

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

86.3.2 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>RADIUS server index.</td>
</tr>
</tbody>
</table>

86.3.3 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>
**86.3.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>RADIUS server index</td>
</tr>
</tbody>
</table>

**86.3.5 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>RADIUS server index</td>
</tr>
</tbody>
</table>

**86.4 clear**

Clear several items.

**86.4.1 clear radius**

Clear the RADIUS statistics.

- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** clear radius <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>statistics</td>
</tr>
</tbody>
</table>

Clear the RADIUS statistics.
87 Redundant Coupling Protocol (RCP)

87.1 redundant-coupling
Set RCP parameters.

87.1.1 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

87.1.2 redundant-coupling timeout
Set RCP timeout in milliseconds.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: redundant-coupling timeout <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5..60000</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

87.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>master</td>
<td>Set this device as master RCP device.</td>
</tr>
<tr>
<td></td>
<td>slave</td>
<td>Set this device as slave RCP device.</td>
</tr>
<tr>
<td></td>
<td>single</td>
<td>Set this device as single RCP device.</td>
</tr>
<tr>
<td></td>
<td>auto</td>
<td>Let the RCP decide the role of this device.</td>
</tr>
</tbody>
</table>

87.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

87.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

87.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
87.1.7 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

87.2 show

Display device options and settings.

87.2.1 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

87.2.2 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

87.2.3 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
88 Remote Authentication

88.1 ldap
Configure LDAP settings.

88.1.1 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

88.1.2 ldap cache-timeout
Configure LDAP user cache entry timeout.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap cache-timeout <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..1440</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

88.1.3 ldap flush-user-cache
Flush LDAP user cache.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap flush-user-cache <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>action</td>
<td>Flush the LDAP user cache.</td>
</tr>
</tbody>
</table>

88.1.4 ldap role-policy
Configure LDAP user role selection policy.
- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap role-policy <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>highest</td>
<td>Use the role mapping with the highest user role.</td>
</tr>
<tr>
<td></td>
<td>first</td>
<td>Use the first matching role mapping table entry.</td>
</tr>
</tbody>
</table>

88.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

88.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>
### 88.1.7 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>

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
</tr>
<tr>
<td></td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

### 88.1.8 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>

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
</tr>
<tr>
<td></td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

### 88.1.9 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>

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
</tr>
<tr>
<td></td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

### 88.1.10 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.

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
</tr>
<tr>
<td></td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
</tr>
<tr>
<td></td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..65535</td>
</tr>
<tr>
<td></td>
<td>Port number of LDAP Server.</td>
</tr>
<tr>
<td>P-4</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>ssl</td>
</tr>
<tr>
<td></td>
<td>startTLS</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
</tr>
<tr>
<td></td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
</tbody>
</table>

### 88.1.11 ldap client server delete
Delete a LDAP client server connection.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap client server delete <P-1>

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
</tr>
<tr>
<td></td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 88.1.12 ldap client server enable
Enable a LDAP client server connection.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap client server enable <P-1>

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
</tr>
<tr>
<td></td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 88.1.13 ldap client server disable
Disable a LDAP client server connection.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap client server disable <P-1>
88.1.14 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>1,65535</td>
<td>Port number of LDAP Server.</td>
</tr>
<tr>
<td>P-4</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ssl</td>
<td></td>
</tr>
<tr>
<td></td>
<td>startTLS</td>
<td></td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
</tbody>
</table>

88.1.15 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>attribute group</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

88.1.16 ldap mapping delete

Delete a LDAP role mapping entry.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap mapping delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

88.1.17 ldap mapping enable

Activate a LDAP role mapping entry.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap mapping enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

88.1.18 ldap mapping disable

Deactivate a LDAP role mapping entry.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** ldap mapping disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
88.2 show
Display device options and settings.

88.2.1 show ldap global
Display the LDAP configuration parameters and information.
► Mode: Command is in all modes available.
► Privilege Level: Administrator
► Format: show ldap global

88.2.2 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

88.2.3 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..64</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

88.3 copy
Copy different kinds of items.

88.3.1 copy ldapcacert remote
Copy CA certificate file (*.pem) from the remote AD server to the specified destination.
► Mode: Privileged Exec Mode
► Privilege Level: Administrator
► Format: copy ldapcacert 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
<tr>
<td>P-3 slot no./port no.</td>
<td>string</td>
<td></td>
</tr>
</tbody>
</table>

88.3.2 copy ldapcacert envm
Copy CA certificate file (*.pem) from external non-volatile memory to the specified destination.
► Mode: Privileged Exec Mode
► Privilege Level: Administrator
► Format: copy ldapcacert envm <P-1> nvm [<P-2>]
nvm: Copy CA certificate file (*.pem) from external non-volatile memory to the device.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 100 characters.</td>
</tr>
</tbody>
</table>
89 Remote Monitoring (RMON)

89.1 rmon-alarm

Create a RMON alarm action.

89.1.1 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter an object identifier of the particular variable to be sampled, max. 32 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2147483647</td>
<td>Enter the rising threshold for the sampled statistic.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..2147483647</td>
<td>Enter the falling threshold for the sampled statistic.</td>
</tr>
</tbody>
</table>

89.1.2 rmon-alarm enable

Enable RMON alarm.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** rmon-alarm enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
</tbody>
</table>

89.1.3 rmon-alarm disable

Disable RMON alarm.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** rmon-alarm disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
</tbody>
</table>

89.1.4 rmon-alarm delete

Delete RMON alarm.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** rmon-alarm delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
</tbody>
</table>

89.1.5 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
</tbody>
</table>
[falling-event]: Enter the alarm falling-event index.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>Enter an index that uniquely identifies an entry in the alarm table.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter an object identifier of the particular variable to be sampled, max. 32 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..2147483647</td>
<td>Enter the rising threshold for the sampled statistic.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..2147483647</td>
<td>Enter the falling threshold for the sampled statistic.</td>
</tr>
<tr>
<td>P-5</td>
<td>1..2147483647</td>
<td>Enter the interval in seconds over which the data is sampled and compared with the rising and falling thresholds.</td>
</tr>
<tr>
<td>P-6</td>
<td>absoluteValue</td>
<td>Variable is compared directly with the thresholds.</td>
</tr>
<tr>
<td></td>
<td>deltaValue</td>
<td>Variable is subtracted from the current value and the difference compared with the thresholds.</td>
</tr>
<tr>
<td>P-7</td>
<td>risingAlarm</td>
<td>Single rising alarm generated when the sample is greater than or equal to the rising threshold.</td>
</tr>
<tr>
<td></td>
<td>fallingAlarm</td>
<td>Single falling alarm generated when the sample is less than or equal to the falling threshold.</td>
</tr>
<tr>
<td></td>
<td>risingOrFallingAlarm</td>
<td>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.</td>
</tr>
<tr>
<td>P-8</td>
<td>1..65535</td>
<td>Enter the index of the event entry that is used when a rising threshold is crossed.</td>
</tr>
<tr>
<td>P-9</td>
<td>1..65535</td>
<td>Enter the index of the event entry that is used when a falling threshold is crossed.</td>
</tr>
</tbody>
</table>

89.2 show
Display device options and settings.

89.2.1 show rmon statistics
Display the RMON statistics configuration.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show rmon statistics [<P-1>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

89.2.2 show rmon alarm
Display the configuration on RMON alarms.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show rmon alarm
90 Script File

90.1 script

CLI Script File.

90.1.1 script apply

Executes the CLI script file available in the device.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** `script apply <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
</tbody>
</table>

90.1.2 script validate

Only validates the CLI script file available in the device.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** `script validate <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
</tbody>
</table>

90.1.3 script list system

List all the script files available in the device memory.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** `script list system`

90.1.4 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`

90.1.5 script delete

Delete the CLI script files.
- **Mode:** Privileged Exec Mode
- **Privilege Level:** Administrator
- **Format:** `script delete [<P-1>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
</tbody>
</table>

90.2 copy

Copy different kinds of items.

90.2.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>
90.2.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

90.2.3 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
  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.
  ```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

90.2.4 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

90.2.5 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

90.2.6 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>
90.3 **show**

Display device options and settings.

90.3.1 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename</td>
</tr>
</tbody>
</table>

90.3.2 **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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Filename</td>
</tr>
</tbody>
</table>
91 Selftest

91.1 selftest
Configure the selftest settings.

91.1.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>task</td>
<td>Configure the action for task errors.</td>
</tr>
<tr>
<td></td>
<td>resource</td>
<td>Configure the action for lack of resources.</td>
</tr>
<tr>
<td></td>
<td>software</td>
<td>Configure the action for broken software integrity.</td>
</tr>
<tr>
<td></td>
<td>hardware</td>
<td>Configure the action for detected hardware errors.</td>
</tr>
<tr>
<td>P-2</td>
<td>log-only</td>
<td>Write a message to the logging file.</td>
</tr>
<tr>
<td></td>
<td>send-trap</td>
<td>Send a trap to the management station.</td>
</tr>
<tr>
<td></td>
<td>reboot</td>
<td>Reboot the device.</td>
</tr>
</tbody>
</table>

91.1.2 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

91.1.3 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 misconfiguration.
➤ 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

91.1.4 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
91.1.5 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`

91.2 show
Display device options and settings.

91.2.1 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`

91.2.2 show selftest settings
Display the selftest settings.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: `show selftest settings`
92 sFlow

92.1 sflow

Configure sFlow

92.1.1 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.
- **maxdatagram:** Configure sflow maximum size of the receiver datagram.
- **ip:** Configure sflow receiver IP address.
- **port:** Configure sflow receiver port.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Enter a sFlow receiver index.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter receiver owner string, max. 127 characters.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>-1..2147483647</td>
<td>Enter timeout: -1: no timeout, 0: reset configuration, 1 - 2147483647. Note: timeout setting will not be saved.</td>
</tr>
<tr>
<td>P-5</td>
<td>-1..2147483647</td>
<td>Enter timeout: -1: no timeout, 0: reset configuration, 1 - 2147483647. Note: timeout setting will not be saved.</td>
</tr>
<tr>
<td>P-6</td>
<td>200..3996</td>
<td>Enter maximum datagram size between 200 and 3996.</td>
</tr>
<tr>
<td>P-7</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-8</td>
<td>1..65535</td>
<td>Enter port number between 1 and 65535</td>
</tr>
</tbody>
</table>

92.2 sflow

Configure sflow sampler and poller.

92.2.1 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>] [rate <P-3>]
```

- **interval:** Set an interval for this poller.
- **rate:** Configure sflow sampler rate.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..8</td>
<td>Enter a sFlow receiver index, 0 to reset configuration.</td>
</tr>
<tr>
<td>P-2</td>
<td>0..86400</td>
<td>Enter poller interval between 0 and 86400. Enter 0 to disable the poller.</td>
</tr>
</tbody>
</table>

92.2.2 sflow poller interval

Set an interval for this poller.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:**

```
sflow poller interval <P-1>
```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..86400</td>
<td>Enter poller interval between 0 and 86400. Enter 0 to disable the poller.</td>
</tr>
</tbody>
</table>

92.2.3 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.
92.2.4 sflow sampler rate
Configure sflow sampler rate.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..8</td>
<td>Enter a sFlow receiver index, 0 to reset configuration.</td>
</tr>
<tr>
<td>P-2</td>
<td>0</td>
<td>Disable sampling</td>
</tr>
<tr>
<td></td>
<td>256-65535</td>
<td>Set sampling rate</td>
</tr>
</tbody>
</table>

92.2.5 sflow sampler maxheadersize
Configure sflow sampler maximum header size.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>Disable sampling</td>
</tr>
<tr>
<td></td>
<td>256-65535</td>
<td>Set sampling rate</td>
</tr>
</tbody>
</table>

92.3 show
Display device options and settings.

92.3.1 show sflow agent
Display the sflow agent settings.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1..8</td>
<td>Enter a sFlow receiver index.</td>
</tr>
</tbody>
</table>

92.3.2 show sflow receivers
Display the sflow receiver settings.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Enter a sFlow receiver index.</td>
</tr>
</tbody>
</table>

92.3.3 show sflow pollers
Display the sflow poller settings.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1..8</td>
<td>Enter a sFlow receiver index.</td>
</tr>
</tbody>
</table>

92.3.4 show sflow samplers
Display the sflow sampler settings.
93 Small Form-factor Pluggable (SFP)

93.1 show
Display device options and settings.

93.1.1 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
94 Signal Contact

94.1 signal-contact
Configure the signal contact settings.

94.1.1 signal-contact mode
Configure the Signal Contact mode setting.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `signal-contact <P-1> mode <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>manual</td>
<td>The signal contact's status is determined by the associated manual setting (subcommand 'state').</td>
</tr>
<tr>
<td></td>
<td>monitor</td>
<td>The signal contact's status is determined by the associated monitor settings.</td>
</tr>
<tr>
<td></td>
<td>device-status</td>
<td>The signal contact's status is determined by the device status.</td>
</tr>
<tr>
<td></td>
<td>security-status</td>
<td>The signal contact's status is determined by the security status.</td>
</tr>
<tr>
<td></td>
<td>dev-sec-status</td>
<td>The signal contact's status is determined by the device status and security status.</td>
</tr>
</tbody>
</table>

94.1.2 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`

- **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`

94.1.3 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`

- **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`

94.1.4 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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>
### 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

### 94.1.5 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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

### 94.1.6 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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

### 94.1.7 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

### no signal-contact monitor temperature
Disable the option
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** no signal-contact <P-1> monitor temperature

### 94.1.8 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

### 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
94.1.9 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>1..2</td>
<td>Number of power supply.</td>
</tr>
</tbody>
</table>

■ 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>`

94.1.10 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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

■ 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`

94.1.11 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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

■ no signal-contact monitor humidity
Disable the option
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `no signal-contact <P-1> monitor humidity`

94.1.12 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>open</td>
<td>Open the signal contact (only takes effect in the manual mode).</td>
</tr>
<tr>
<td></td>
<td>close</td>
<td>Close the signal contact (only takes effect in the manual mode).</td>
</tr>
</tbody>
</table>

94.1.13 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`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>
no signal-contact trap
Disable the option
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: no signal-contact <P-1> trap

94.1.14 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

no signal-contact module
Disable the option
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: no signal-contact <P-1> module <P-2>

94.1.15 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>1..1</td>
<td>Number of fan modules.</td>
</tr>
</tbody>
</table>

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>

94.2 signal-contact
Configure the signal contact interface settings.

94.2.1 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>

no signal-contact link-alarm
Disable the option
► Mode: Interface Range Mode
► Privilege Level: Administrator
► Format: no signal-contact <P-1> link-alarm

94.3 show
Display device options and settings.
94.3.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>signal contact no.</td>
<td></td>
</tr>
</tbody>
</table>
95 Signed Firmware

95.1 firmware
Configure firmware parameters.

95.1.1 firmware allow-unsigned
Allow to upload unsigned device software.
▶ Mode: Global Config Mode
▶ Privilege Level: Administrator
▶ Format: firmware allow-unsigned <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable the option.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable the option.</td>
</tr>
</tbody>
</table>

95.2 show
Display device options and settings.

95.2.1 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

95.2.2 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
96  Slot

96.1  slot
Configure module status.

96.1.1  slot operation
Enable or disable slot
  ▶  Mode: Global Config Mode
  ▶  Privilege Level: Operator
  ▶  Format: slot <P-1> operation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

no slot operation
Disable the option
  ▶  Mode: Global Config Mode
  ▶  Privilege Level: Operator
  ▶  Format: no slot <P-1> operation

96.1.2  slot module
Remove a virtual module
  ▶  Mode: Global Config Mode
  ▶  Privilege Level: Operator
  ▶  Format: slot <P-1> module <P-2>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>remove-virtual</td>
<td>Remove a virtual module</td>
</tr>
</tbody>
</table>

96.2  show
Display device options and settings.

96.2.1  show slot
Display the module parameters.
  ▶  Mode: Command is in all modes available.
  ▶  Privilege Level: Guest
  ▶  Format: show slot [<P-1>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
97 Switched Monitoring (SMON)

97.1 monitor
Configure port mirroring.

97.1.1 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.
direction: Select interface.
operation: Enable/disable mirroring on an interface.
vlan: Set the VLAN to mirror.
remote: Source RSPAN configuration.
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>Monitor session index.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-4</td>
<td>integer</td>
<td>VLAN Mirror Remote VLAN ID List.</td>
</tr>
<tr>
<td>P-5</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-6</td>
<td>none</td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td>tx</td>
<td>Packets that are transmitted on the source interfaces are copied to the destination interface.</td>
</tr>
<tr>
<td></td>
<td>rx</td>
<td>Packets that are received on the source interfaces are copied to the destination interface.</td>
</tr>
<tr>
<td></td>
<td>txrx</td>
<td>Packets that are transmitted or received on the source interfaces are copied to the destination interface.</td>
</tr>
<tr>
<td>P-7</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
<tr>
<td>P-8</td>
<td>integer</td>
<td>VLAN Mirror Remote VLAN ID List.</td>
</tr>
</tbody>
</table>

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

97.2 rspan-vlan

97.2.1 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 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.
P-7 0..4042 Enter the VLAN ID. Entering of ID 0 disables the feature.
P-8 integer VLAN Mirror Remote VLAN ID List.
97.3 show

Display device options and settings.

97.3.1 show monitor session

Display port monitor session settings.

- **Mode**: Command is in all modes available.
- **Privilege Level**: Guest
- **Format**: `show monitor session <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>integer</td>
<td>VLAN Mirror Remote VLAN ID List.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>Monitor session index.</td>
</tr>
</tbody>
</table>

97.4 clear

Clear several items.

97.4.1 clear monitor session

Delete configuration for this session.

- **Mode**: Privileged Exec Mode
- **Privilege Level**: Operator
- **Format**: `clear monitor session <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1</td>
<td>Monitor session index.</td>
</tr>
</tbody>
</table>
98  Simple Network Management Protocol (SNMP)

98.1  snmp
Configure of SNMP versions and traps.

98.1.1  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

98.1.2  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

98.1.3  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

98.1.4  snmp access port
Configure the SNMP access port.
  ▶  Mode: Global Config Mode
  ▶  Privilege Level: Administrator
  ▶  Format: snmp access port <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1-65535</td>
<td>Port number of the SNMP server (default: 161).</td>
</tr>
</tbody>
</table>

98.1.5  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

98.2 show
Display device options and settings.

98.2.1 show snmp access
Display the SNMP access configuration settings.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show snmp access
99  SNMP Community

99.1  snmp
Configure of SNMP versions and traps.

99.1.1  snmp community ro
SNMP v1/v2 read-only community.
➤ Mode: Global Config Mode
➤ Privilege Level: Administrator
➤ Format: snmp community ro

99.1.2  snmp community rw
SNMP v1/v2 read-write community.
➤ Mode: Global Config Mode
➤ Privilege Level: Administrator
➤ Format: snmp community rw

99.2  show
Display device options and settings.

99.2.1  show snmp community
Display the SNMP v1/2 community.
➤ Mode: Command is in all modes available.
➤ Privilege Level: Administrator
➤ Format: show snmp community
100SNMP Logging

100.1 logging
Logging configuration.

100.1.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable logging of SNMP GET or SET requests.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable logging of SNMP GET or SET requests.</td>
</tr>
</tbody>
</table>

- **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>

100.1.2 logging snmp-request get severity
Define severity level.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** logging snmp-request get severity <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>alert</td>
<td>Take immediate action. Potential unrecoverable failure of a component.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

100.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>enable</td>
<td>Enable logging of SNMP GET or SET requests.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td>Disable logging of SNMP GET or SET requests.</td>
</tr>
</tbody>
</table>

- **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>
100.1.4 logging snmp-request set severity

Define severity level.

- **Mode**: Global Config Mode
- **Privilege Level**: Administrator
- **Format**: `logging snmp-request set severity <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>emergency</td>
<td>System is unusable. System failure has been detected.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>Recoverable failure of a component has been detected and may lead to potential system failure.</td>
</tr>
<tr>
<td></td>
<td>error</td>
<td>Error conditions detected. Potential failure of a component recoverable.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>Minor failure, e.g. misconfiguration of a component.</td>
</tr>
<tr>
<td></td>
<td>notice</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td></td>
<td>informational</td>
<td>Informational messages.</td>
</tr>
<tr>
<td></td>
<td>debug</td>
<td>Debug-level messages.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Same as emergency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Same as alert</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Same as critical</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Same as error</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Same as warning</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Same as notice</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Same as informational</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Same as debug</td>
</tr>
</tbody>
</table>

100.2 show

Display device options and settings.

100.2.1 show logging snmp

Display the SNMP logging settings.

- **Mode**: Command is in all modes available.
- **Privilege Level**: Guest
- **Format**: `show logging snmp`
101 Simple Network Time Protocol (SNTP)

101.1 sntp
Configure SNTP settings.

101.1.1 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

101.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>unicast</td>
<td>Set the operating mode to unicast.</td>
</tr>
<tr>
<td></td>
<td>broadcast</td>
<td>Set the operating mode to broadcast.</td>
</tr>
</tbody>
</table>

101.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5..3600</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

101.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>128..2048</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

101.1.5 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
101.1.6 sntp client interface
Change the interface of the SNTP server
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: sntp client interface <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td></td>
<td>slot no./port no.</td>
</tr>
</tbody>
</table>

101.1.7 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>1.65535</td>
<td>Port number of SNTP Server (default 123).</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

101.1.8 sntp client server delete
delete a SNTP client server connection
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: sntp client server delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

101.1.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

no sntp client server mode
Disable the option
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: no sntp client server mode <P-1>

101.1.10 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

101.1.11 sntp server interface
Change the interface of the SNTP server
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: sntp server interface <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
### 101.1.12 sntp 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>123</td>
<td>Port number of SNTP Server (default 123).</td>
</tr>
</tbody>
</table>

### 101.1.13 sntp 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

### 101.1.14 sntp 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

### 101.1.15 sntp 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

### 101.1.16 sntp 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>123</td>
<td>Port number of SNTP Server (default 123).</td>
</tr>
</tbody>
</table>

### 101.1.17 sntp 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>64.1024</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 101.1.18 sntp 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>
101.2 show
Display device options and settings.

101.2.1 show sntp global
Display the SNTP configuration parameters and information.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show sntp global

101.2.2 show sntp client status
Display the SNTP client status.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show sntp client status

101.2.3 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 uses the management VLAN ID.</td>
</tr>
</tbody>
</table>

101.2.4 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

101.2.5 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
102 Spanning Tree

102.1 spanning-tree
Enable or disable the Spanning Tree protocol.

102.1.1 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

102.1.2 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

102.1.3 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

102.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>4..30</td>
<td>Enter the bridge forward delay as an integer.</td>
</tr>
</tbody>
</table>

102.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2</td>
<td>Set the Hello Time parameter (unit: seconds).</td>
</tr>
</tbody>
</table>
102.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40</td>
<td>Set bridge hold count parameter.</td>
</tr>
</tbody>
</table>

102.1.7 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>6..40</td>
<td>Set the bridge Max Age parameter.</td>
</tr>
</tbody>
</table>

102.1.8 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>6..40</td>
<td>Set the bridge Max Hops parameter.</td>
</tr>
</tbody>
</table>

102.1.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..0</td>
<td>Enter the multiple spanning tree ID 0 (0 is for CIST and RSTP).</td>
</tr>
<tr>
<td>P-2</td>
<td>0..61440</td>
<td>Set the Mst Bridge priority.</td>
</tr>
</tbody>
</table>

102.1.10 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

102.1.11 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

102.1.12 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
102.1.13 spanning-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

102.1.14 spanning-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

102.1.15 spanning-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

102.1.16 spanning-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

102.1.17 spanning-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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

102.1.18 spanning-tree forceversion
Set the force protocol version parameter.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** spanning-tree forceversion <P-1>
102.1.19 spanning-tree forward-time
Set the Bridge Forward Delay parameter [s].
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: spanning-tree forward-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>4..30</td>
<td>Enter the bridge forward delay as an integer.</td>
</tr>
</tbody>
</table>

102.1.20 spanning-tree hello-time
Set the Hello Time parameter [s].
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: spanning-tree hello-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2</td>
<td>Set the Hello Time parameter (unit: seconds).</td>
</tr>
</tbody>
</table>

102.1.21 spanning-tree hold-count
Set the bridge hold count parameter.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: spanning-tree hold-count <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40</td>
<td>Set bridge hold count parameter.</td>
</tr>
</tbody>
</table>

102.1.22 spanning-tree max-age
Set the bridge Max Age parameter.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: spanning-tree max-age <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>6..40</td>
<td>Set the bridge Max Age parameter.</td>
</tr>
</tbody>
</table>

102.1.23 spanning-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
```
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: no spanning-tree ring-only-mode operation

102.1.24 spanning-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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

102.1.25 spanning-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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
### 102.1.26 spanning-tree max-hops

Set the bridge Max Hops parameter.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** spanning-tree max-hops <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>6.40</td>
<td>Set the bridge Max Hops parameter.</td>
</tr>
</tbody>
</table>

### 102.1.27 spanning-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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.0</td>
<td>Enter the multiple spanning tree ID 0 (0 is for CIST and RSTP).</td>
</tr>
<tr>
<td>P-2</td>
<td>0.61440</td>
<td>Set the Mst Bridge priority.</td>
</tr>
</tbody>
</table>

### 102.1.28 spanning-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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.4094</td>
<td>Enter a multiple spanning tree ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>0.61440</td>
<td>Set the Mst Bridge priority.</td>
</tr>
</tbody>
</table>

### 102.1.29 spanning-tree mst instance delete

Destroy a MST instance.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** spanning-tree mst instance delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4094</td>
<td>Enter a multiple spanning tree ID.</td>
</tr>
</tbody>
</table>

### 102.1.30 spanning-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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.4094</td>
<td>Enter a multiple spanning tree ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>0.61440</td>
<td>Set the Mst Bridge priority.</td>
</tr>
<tr>
<td>P-3</td>
<td>1.4042</td>
<td>Select the MST bridge VLAN.</td>
</tr>
<tr>
<td>P-4</td>
<td>1.4042</td>
<td>Select the MST bridge VLAN.</td>
</tr>
</tbody>
</table>

### 102.1.31 spanning-tree configuration name

Set the MST configuration name.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** spanning-tree configuration name <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; Enter a valid name for the configuration.</td>
</tr>
</tbody>
</table>
102.1.32 spanning-tree configuration revision

Set the MST configuration identifier revision level.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** `spanning-tree configuration revision <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..65535</td>
<td>Enter a revision number between 0 and 65535.</td>
</tr>
</tbody>
</table>

102.2 spanning-tree

Enable or disable the Spanning Tree protocol on a port.

102.2.1 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`

102.2.2 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`

102.2.3 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`

102.2.4 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`
102.2.5 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

102.2.6 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

102.2.7 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

102.2.8 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

102.2.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..200000000</td>
<td>Specify the port path cost.</td>
</tr>
</tbody>
</table>

102.2.10 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>
102.2.11 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>

**Parameter** | **Value** | **Meaning**
---|---|---
P-1 | 0..240 | Specify the port priority.

102.3 show
Display device options and settings.

102.3.1 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

102.3.2 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

102.3.3 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.

102.3.4 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.

102.3.5 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.
102.3.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
103 Subring Management

103.1 sub-ring
Sub-ring manager operations.

103.1.1 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

103.1.2 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).

103.1.3 sub-ring delete
Deletes the subring domain with the value id.

- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: sub-ring delete <P-1>

103.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40000</td>
<td>SRM Domain Id.</td>
</tr>
<tr>
<td>P-2</td>
<td>manager</td>
<td>The entity takes on the role of a Sub-Ring Manager.</td>
</tr>
<tr>
<td></td>
<td>redundant-manager</td>
<td>The entity takes on the role of the Sub-Ring Manager and blocks the ring port if the sub-ring is closed.</td>
</tr>
<tr>
<td></td>
<td>single-manager</td>
<td>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.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
<tr>
<td>P-6</td>
<td>&lt;domain id&gt;</td>
<td>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).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.40000</td>
<td>SRM Domain Id.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.40000</td>
<td>SRM Domain Id.</td>
</tr>
</tbody>
</table>
103.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40000</td>
<td>SRM Domain Id.</td>
</tr>
</tbody>
</table>

103.1.6 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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40000</td>
<td>SRM Domain Id.</td>
</tr>
<tr>
<td>P-2</td>
<td>manager</td>
<td>The entity takes on the role of a Sub-Ring Manager.</td>
</tr>
<tr>
<td></td>
<td>redundant-manager</td>
<td>The entity takes on the role of the Sub-Ring Manager and blocks the ring port if the sub-ring is closed.</td>
</tr>
<tr>
<td></td>
<td>single-manager</td>
<td>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.</td>
</tr>
<tr>
<td>P-3</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
<tr>
<td>P-4</td>
<td>slot no./port no.</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
<tr>
<td>P-5</td>
<td>string</td>
<td>&lt;domain id&gt; 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).</td>
</tr>
</tbody>
</table>

103.2 show
Display device options and settings.

103.2.1 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

103.2.2 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..40000</td>
<td>SRM Domain Id.</td>
</tr>
</tbody>
</table>
104 Secure Shell (SSH)

104.1 ssh
Set SSH parameters.

104.1.1 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`

104.1.2 ssh timeout
Set the SSH connection idle timeout in minutes (default: 5).
- **Mode**: Global Config Mode
- **Privilege Level**: Administrator
- **Format**: `ssh timeout <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..160</td>
<td>Idle timeout of a session in minutes (default: 5).</td>
</tr>
</tbody>
</table>

104.1.3 ssh port
Set the SSH server port number (default: 22).
- **Mode**: Global Config Mode
- **Privilege Level**: Administrator
- **Format**: `ssh port <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..65535</td>
<td>Port number of the SSH server (default: 22).</td>
</tr>
</tbody>
</table>

104.1.4 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>Maximum number of concurrent SSH sessions.</td>
</tr>
</tbody>
</table>

104.1.5 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..5</td>
<td>Maximum number of concurrent SSH sessions.</td>
</tr>
</tbody>
</table>

104.1.6 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..160</td>
<td>Idle timeout of a session in minutes (default: 5).</td>
</tr>
</tbody>
</table>
**104.1.7 ssh key rsa**
Generate or delete RSA key
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ssh key rsa <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>generate</td>
<td>Generates the item</td>
</tr>
<tr>
<td></td>
<td>delete</td>
<td>Deletes the item</td>
</tr>
</tbody>
</table>

**104.1.8 ssh key fingerprint-type**
Configure fingerprint type
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** `ssh key fingerprint-type <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>md5</td>
<td>Configure md5 fingerprint of the existing SSH host key</td>
</tr>
<tr>
<td></td>
<td>sha256</td>
<td>Configure sha256 fingerprint of the existing SSH host key</td>
</tr>
</tbody>
</table>

**104.2 ssh**

**104.2.1 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..65535</td>
<td>Enter port number between 1 and 65535</td>
</tr>
</tbody>
</table>

**104.3 copy**
Copy different kinds of items.

**104.3.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

**104.3.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 128 characters.</td>
</tr>
</tbody>
</table>
104.4 show
Display device options and settings.

104.4.1 show ssh
Display the SSH server and client information.
➤ **Mode:** Command is in all modes available.
➤ **Privilege Level:** Guest
➤ **Format:** show ssh
105 Storm Control

105.1 storm-control
Configure the global storm-control settings.

105.1.1 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

105.2 traffic-shape
Traffic shape commands.

105.2.1 traffic-shape bw
Set threshold value
- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: traffic-shape bw <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

105.3 mtu

105.3.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1518..12288</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

105.4 mtu

105.4.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1518..1530</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
105.5 mtu

105.5.1 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1518..12288</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

105.6 storm-control

Storm control commands

105.6.1 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`

105.6.2 storm-control ingress unit
Set unit.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `storm-control ingress unit <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>percent</td>
<td>Metering unit expressed in percentage of bandwidth.</td>
</tr>
<tr>
<td>P-1</td>
<td>pps</td>
<td>Metering unit expressed in packets per second.</td>
</tr>
</tbody>
</table>

105.6.3 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>

105.6.4 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`
105.6.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>

105.6.6 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

105.6.7 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>

105.6.8 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

105.6.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>

105.6.10 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>
105.6.11 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

105.6.12 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..14880000</td>
<td>Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.</td>
</tr>
</tbody>
</table>

105.7 show
Display device options and settings.

105.7.1 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

105.7.2 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

105.7.3 show traffic-shape
Display the traffic shape parameters.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show traffic-shape

105.7.4 show mtu
Display the MTU parameters.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show mtu
106 System

106.1 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.

106.1.1 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

106.1.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

106.1.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

106.1.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>portpanel</td>
<td>Set LED control to portpanel.</td>
</tr>
<tr>
<td></td>
<td>servicepanel</td>
<td>Set LED control to servicepanel.</td>
</tr>
</tbody>
</table>

106.1.5 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
### 106.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter a user-defined text, max. 512 characters (allowed characters are from ASCII 32 to 127).</td>
</tr>
</tbody>
</table>

### 106.1.7 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

### 106.2 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.

#### 106.2.1 temperature upper-limit

Configure the upper temperature limit.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** temperature upper-limit <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-99.99</td>
<td>Upper temperature threshold ([C], default 70).</td>
</tr>
</tbody>
</table>

#### 106.2.2 temperature lower-limit

Configure the lower temperature limit.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** temperature lower-limit <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>-99.99</td>
<td>Lower temperature threshold ([C], default 0).</td>
</tr>
</tbody>
</table>

### 106.3 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.

#### 106.3.1 humidity upper-limit

Configure the upper humidity limit.

- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** humidity upper-limit <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>Upper humidity threshold ([%], default 95%).</td>
</tr>
</tbody>
</table>
106.3.2 humidity lower-limit
Configure the lower humidity limit.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: humidity lower-limit <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..100</td>
<td>Lower humidity threshold [%], default 5.</td>
</tr>
</tbody>
</table>

106.4 hardware
Run-time Lan by-pass feature ensures that traffic pass freely between interface pairs, when system is fully up and is running an Operating System

106.4.1 hardware by-pass
Enable or disable Run-time hardware lan by-pass.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: hardware by-pass

  no hardware by-pass
  Disable the option
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: no hardware by-pass

106.5 show
Display device options and settings.

106.5.1 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

106.5.2 show system info
Display the system related information.
  ▶ Mode: Command is in all modes available.
  ▶ Privilege Level: Guest
  ▶ Format: show system info

106.5.3 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

106.5.4 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
106.5.5 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

106.5.6 show system temperature limits
Display the temperature limits.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show system temperature limits

106.5.7 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

106.5.8 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

106.5.9 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

106.5.10 show system humidity limits
Display the humidity limits.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show system humidity limits

106.5.11 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

106.5.12 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

106.5.13 show 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

106.5.14 show psu slot
Display the power supply slots.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show psu slot
106.5.15 show psu unit
Display the information for the power supply units.
▷ **Mode:** Command is in all modes available.
▷ **Privilege Level:** Guest
▷ **Format:** `show psu unit`

106.5.16 show fan
Display the information for the fan modules.
▷ **Mode:** Command is in all modes available.
▷ **Privilege Level:** Guest
▷ **Format:** `show fan`

106.5.17 show hardware by-pass
Display state of hardware by-pass.
▷ **Mode:** Command is in all modes available.
▷ **Privilege Level:** Guest
▷ **Format:** `show hardware by-pass`
107Telnet

107.1 telnet
Set Telnet parameters.

107.1.1 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

107.1.2 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).

107.1.3 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.

107.1.4 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.

107.2 telnet

107.2.1 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).
107.3 show
Display device options and settings.

107.3.1 show telnet
Display the telnet server information.
- **Mode**: Command is in all modes available.
- **Privilege Level**: Guest
- **Format**: show telnet
108 Time Range

108.1 time

Create or delete time range.

108.1.1 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.
```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the time range name, max. 31 characters.</td>
</tr>
<tr>
<td>P-2</td>
<td>hh:mm</td>
<td>Time of day, in 24-hour format.</td>
</tr>
<tr>
<td>P-3</td>
<td>1..31</td>
<td>Day of the month.</td>
</tr>
<tr>
<td>P-4</td>
<td>jan</td>
<td>January</td>
</tr>
<tr>
<td></td>
<td>feb</td>
<td>February</td>
</tr>
<tr>
<td></td>
<td>mar</td>
<td>March</td>
</tr>
<tr>
<td></td>
<td>apr</td>
<td>April</td>
</tr>
<tr>
<td></td>
<td>may</td>
<td>May</td>
</tr>
<tr>
<td></td>
<td>jun</td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>jul</td>
<td>July</td>
</tr>
<tr>
<td></td>
<td>aug</td>
<td>August</td>
</tr>
<tr>
<td></td>
<td>sep</td>
<td>September</td>
</tr>
<tr>
<td></td>
<td>oct</td>
<td>October</td>
</tr>
<tr>
<td></td>
<td>nov</td>
<td>November</td>
</tr>
<tr>
<td></td>
<td>dec</td>
<td>December</td>
</tr>
<tr>
<td>P-5</td>
<td>1993..2035</td>
<td>Year.</td>
</tr>
<tr>
<td>P-6</td>
<td>hh:mm</td>
<td>Time of day, in 24-hour format.</td>
</tr>
<tr>
<td>P-7</td>
<td>1..31</td>
<td>Day of the month.</td>
</tr>
<tr>
<td>P-8</td>
<td>jan</td>
<td>January</td>
</tr>
<tr>
<td></td>
<td>feb</td>
<td>February</td>
</tr>
<tr>
<td></td>
<td>mar</td>
<td>March</td>
</tr>
<tr>
<td></td>
<td>apr</td>
<td>April</td>
</tr>
<tr>
<td></td>
<td>may</td>
<td>May</td>
</tr>
<tr>
<td></td>
<td>jun</td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>jul</td>
<td>July</td>
</tr>
<tr>
<td></td>
<td>aug</td>
<td>August</td>
</tr>
<tr>
<td></td>
<td>sep</td>
<td>September</td>
</tr>
<tr>
<td></td>
<td>oct</td>
<td>October</td>
</tr>
<tr>
<td></td>
<td>nov</td>
<td>November</td>
</tr>
<tr>
<td></td>
<td>dec</td>
<td>December</td>
</tr>
<tr>
<td>P-9</td>
<td>1993..2035</td>
<td>Year.</td>
</tr>
<tr>
<td>P-10</td>
<td>weekday</td>
<td>A comma-separated combination of days</td>
</tr>
<tr>
<td></td>
<td>sunday</td>
<td>Sunday</td>
</tr>
<tr>
<td></td>
<td>monday</td>
<td>Monday</td>
</tr>
<tr>
<td></td>
<td>tuesday</td>
<td>Tuesday</td>
</tr>
<tr>
<td></td>
<td>wednesday</td>
<td>Wednesday</td>
</tr>
<tr>
<td></td>
<td>thursday</td>
<td>Thursday</td>
</tr>
<tr>
<td></td>
<td>friday</td>
<td>Friday</td>
</tr>
<tr>
<td></td>
<td>saturday</td>
<td>Saturday</td>
</tr>
<tr>
<td></td>
<td>daily</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>weekdays</td>
<td>Weekdays</td>
</tr>
<tr>
<td></td>
<td>weekend</td>
<td>Weekend</td>
</tr>
</tbody>
</table>

**Parameter** | **Value** | **Meaning** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P-11</td>
<td>hh:mm</td>
<td>Time of day, in 24-hour format.</td>
</tr>
</tbody>
</table>
### 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>`

### 108.2 show
Display device options and settings.

#### 108.2.1 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>Enter the time range name, max. 31 characters.</td>
</tr>
</tbody>
</table>
109.1 track

Configure tracking instances on the device.

109.1.1 track add

Create a tracking instance.

- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `track add <P-1> <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..256</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.2 track delete

Delete a tracking instance.

- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `track delete <P-1> <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..256</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.3 track enable

Activate a tracking instance.

- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `track enable <P-1> <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..256</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.4 track disable

Deactivate a tracking instance.

- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: `track disable <P-1> <P-2>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..256</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.5 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>1..256</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
no track trap
Disable the option
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Operator
  ▶ Format: no track trap <P-1> <P-2>

109.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>interface</td>
<td>interface tracking</td>
</tr>
<tr>
<td></td>
<td>ping</td>
<td>ping tracking</td>
</tr>
<tr>
<td></td>
<td>logical</td>
<td>logical tracking</td>
</tr>
<tr>
<td>P-2</td>
<td>1-256</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-3</td>
<td>string</td>
<td>Enter a user-defined text, max. 255 characters.</td>
</tr>
</tbody>
</table>

109.1.7 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>0-255</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-4</td>
<td>0-255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.8 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>100..20000</td>
<td>value for ping tracking interval that could be between 100 and 20000.</td>
</tr>
<tr>
<td>P-5</td>
<td>1..10</td>
<td>value for ping tracking that could be between 1 and 10.</td>
</tr>
<tr>
<td>P-6</td>
<td>1..10</td>
<td>value for ping tracking that could be between 1 and 10.</td>
</tr>
<tr>
<td>P-7</td>
<td>10..10000</td>
<td>value for ping tracking time that could be between 10 and 10000.</td>
</tr>
<tr>
<td>P-8</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

109.1.9 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Track instance.</td>
</tr>
</tbody>
</table>
109.2 **show**

Display device options and settings.

#### 109.2.1 **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`

#### 109.2.2 **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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

#### 109.2.3 **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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

#### 109.2.4 **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]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

#### 109.2.5 **show track application**

Display the information on tracking application registrations.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show track application`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
110 Traps

110.1 snmp
Configure of SNMP versions and traps.

110.1.1 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

110.1.2 snmp trap mode
Enable/disable SNMP trap entry.
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: snmp trap mode <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; Trap name (1 to 32 characters)</td>
</tr>
</tbody>
</table>

no snmp trap mode
Disable the option
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: no snmp trap mode <P-1>

110.1.3 snmp trap delete
Delete SNMP trap entry.
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: snmp trap delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; Trap name (1 to 32 characters)</td>
</tr>
</tbody>
</table>

110.1.4 snmp trap add
Add SNMP trap entry.
► Mode: Global Config Mode
► Privilege Level: Administrator
► Format: snmp trap add <P-1> <P-2>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;name&gt; Trap name (1 to 32 characters)</td>
</tr>
<tr>
<td>P-2</td>
<td>a.b.c.d</td>
<td>a.b.c.d Single IPv4 address.</td>
</tr>
<tr>
<td></td>
<td>a.b.c.d:n</td>
<td>a.b.c.d:n IPv4 address with port.</td>
</tr>
</tbody>
</table>

110.2 show
Display device options and settings.
110.2.1 show snmp traps
Display the SNMP traps.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show snmp traps`
111 Time Sensitive Networks (TSN)

111.1 tsn
Configure TSN (Time Sensitive Network) settings.

111.1.1 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

111.1.2 tsn base-time
Configure the base-time.
- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: tsn base-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>time</td>
<td>Enter the base time in the given format YYYY-MM-DD, hh:mm:ss.ns.</td>
</tr>
</tbody>
</table>

111.1.3 tsn cycle-time
Configure the cycle-time in nanoseconds.
- **Mode**: Global Config Mode
- **Privilege Level**: Operator
- **Format**: tsn cycle-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>50000..10000000</td>
<td>Enter the cycle time in nanoseconds.</td>
</tr>
</tbody>
</table>

111.2 tsn
Configure TSN (Time Sensitive Network) settings for interfaces.

111.2.1 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). |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0.7</td>
<td>Enter the Traffic Class value.</td>
</tr>
<tr>
<td>P-2</td>
<td>integer</td>
<td>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).</td>
</tr>
</tbody>
</table>
111.2.2 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

111.2.3 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

111.2.4 tsn base-time
Configure the base-time.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** tsn base-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>time</td>
<td>Enter the base time in the given format YYYY-MM-DD,hh:mm:ss.ns.</td>
</tr>
</tbody>
</table>

111.2.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>gate states</td>
<td>Enter gate state or gate states as comma separated values eg, 1,4,5.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Reset gate states.</td>
</tr>
</tbody>
</table>

111.2.6 tsn cycle-time
Configure the cycle-time in nanoseconds.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** tsn cycle-time <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1000..10000000000</td>
<td>Enter the cycle time in nanoseconds.</td>
</tr>
</tbody>
</table>

111.2.7 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>GCL entry ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>gate states</td>
<td>Enter gate state or gate states as comma separated values eg, 1,4,5.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Reset gate states.</td>
</tr>
<tr>
<td>P-3</td>
<td>80..10000000000</td>
<td>Enter the interval in nanoseconds.</td>
</tr>
</tbody>
</table>
**111.2.8 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default-2-time-slots</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>default-3-time-slots</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc7-tc6-tc5-tc0</td>
<td>Template with 3 entries. First entry is a guard band. Second entry is the traffic class 7. Third entry is the traffic class 6.</td>
</tr>
<tr>
<td></td>
<td>tc5-tc7</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc6-tc7-tc5-tc0</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>tc5-tc0</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc5-tc7-tc6-tc0</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc7-tc5-tc0</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc6-tc7-tc5-tc0</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>gb-tc7-tc5-tc0</td>
<td>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.</td>
</tr>
</tbody>
</table>

**111.2.9 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>GCL entry ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..5</td>
<td>GCL entry ID.</td>
</tr>
<tr>
<td>P-3</td>
<td>80..1000000000</td>
<td>Enter the interval in nanoseconds.</td>
</tr>
<tr>
<td>P-4</td>
<td>1000..1000000000</td>
<td>Enter the interval in nanoseconds.</td>
</tr>
<tr>
<td>P-5</td>
<td>gate states</td>
<td>Enter gate state or gate states as comma separated values eg, 1,4,5.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>Reset gate states.</td>
</tr>
</tbody>
</table>

**111.2.10 tsn gcl delete**

Delete specified GCL entry.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `tsn gcl delete <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..150</td>
<td>GCL entry ID.</td>
</tr>
<tr>
<td></td>
<td>all</td>
<td>Delete all GCL entries.</td>
</tr>
</tbody>
</table>

**111.3 show**

Display device options and settings.

**111.3.1 show tsn global**

Display the TSN global settings.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** `show tsn global`
111.3.2 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

111.3.3 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;P-1&gt;</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

111.3.4 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
112TTDP

112.1 ttdp
Configure the ttdp settings.

112.1.1 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

112.1.2 ttdp backbone-id
Set the backbone ID for this ETBN.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ttdp backbone-id <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>a</td>
<td>Line a.</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>Line b.</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>Line c.</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>Line d.</td>
</tr>
</tbody>
</table>

112.1.3 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

112.1.4 ttdp etbn role
ETBN role(switch or router).
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ttdp etbn role <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>router</td>
<td>Router.</td>
</tr>
<tr>
<td></td>
<td>switch</td>
<td>Switch.</td>
</tr>
</tbody>
</table>

no ttdp etbn role
Disable the option
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: no ttdp etbn role
112.1.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.1.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..32</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.1.7 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.1.8 ttdp consist uuid

Set the UUID for this consist.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ttdp consist uuid <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>yyyy-xxxx-yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy</td>
<td></td>
</tr>
</tbody>
</table>
112.2 show
Display device options and settings.

112.2.1 show ttdp global
Display the TTDP global configuration.
➤ Mode: Command is in all modes available.
➤ Privilege Level: Guest
➤ Format: show ttdp global

112.2.2 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

112.2.3 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

112.2.4 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

112.2.5 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

112.2.6 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..32</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.7 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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.8 show ttdp consists
Display the TTDP train consist configuration.
➤ Mode: Command is in all modes available.
➤ Privilege Level: Guest
➤ Format: show ttdp consists

112.2.9 show ttdp directions
Display the TTDP local ETBN directions configuration.
➤ Mode: Command is in all modes available.
➤ Privilege Level: Guest
➤ Format: show ttdp directions
112.2.10 show ttdp lines
Display the TTDP local ETBN lines configuration.
模式: Command is in all modes available.
权责等级: Guest
格式: show ttdp lines [P-1]

<table>
<thead>
<tr>
<th>参数</th>
<th>值</th>
<th>意义</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..2</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.11 show ttdp hello-statistics
Display the TTDP hello messages statistics.
模式: Command is in all modes available.
权责等级: Guest
格式: show ttdp hello-statistics [P-1] [P-2]

<table>
<thead>
<tr>
<th>参数</th>
<th>值</th>
<th>意义</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.12 show ttdp topology corrected-connectivity-table
Display the TTDP corrected connectivity table.
模式: Command is in all modes available.
权责等级: Guest
格式: show ttdp topology corrected-connectivity-table [P-1]

<table>
<thead>
<tr>
<th>参数</th>
<th>值</th>
<th>意义</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.13 show ttdp topology connectivity-vector
Display the TTDP connectivity vector.
模式: Command is in all modes available.
权责等级: Guest
格式: show ttdp topology connectivity-vector [P-1]

<table>
<thead>
<tr>
<th>参数</th>
<th>值</th>
<th>意义</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

112.2.14 show ttdp topology etbn-vector
Display the ttdp ETBN-vectors.
模式: Command is in all modes available.
权责等级: Guest
格式: show ttdp topology etbn-vector [P-1] [P-2]

<table>
<thead>
<tr>
<th>参数</th>
<th>值</th>
<th>意义</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..63</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..2</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
113 Unicast Routing

113.1 routing
Create routing on VLAN.

113.1.1 routing add
Enable routing on VLAN
- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: routing add <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

113.1.2 routing delete
Disable routing on VLAN
- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: routing delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

113.2 ip
Set IP parameters.

113.2.1 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

113.2.2 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

113.2.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..1000</td>
<td>Enter Proxy ARP max response delay ms</td>
</tr>
</tbody>
</table>
**113.3 show**
Display device options and settings.

**113.3.1 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

**113.4 show**
Display device options and settings.

**113.4.1 show ip interface**
Display the interface parameters.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip interface [P-1]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

**113.4.2 show ip statistics**
Display the global IP statistics.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip statistics

**113.4.3 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>configuration</td>
<td>Active and configured template</td>
</tr>
</tbody>
</table>

**113.5 ip**
IP interface commands.

**113.5.1 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

**113.5.2 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

### 113.5.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

**no ip address secondary**

Disable the option

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** no ip address secondary <P-1>

### 113.5.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

**no ip address primary**

Disable the option

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** no ip address primary

### 113.5.5 ip mtu

Set MTU size for IP protocol

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** ip mtu <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>68..12266</td>
<td>Set the MTU value.</td>
</tr>
</tbody>
</table>

### 113.5.6 ip icmp unreachables

Enables or disables the generation of ICMP Destination Unreachable messages.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** ip icmp unreachables

**no ip icmp unreachables**

Disable the option

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** no ip icmp unreachables

### 113.5.7 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

**113.5.8 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

**113.6 ip**
Set IP parameters.

**113.6.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**113.6.2 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

**113.6.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

**113.6.4 ip route distance**
Default preference for static routes.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ip route distance <P-1>
113.6.5 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-4</td>
<td>string</td>
<td>Track instance.</td>
</tr>
</tbody>
</table>

113.6.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-3</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

113.6.7 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

113.6.8 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>1..255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

113.6.9 ip default-route delete
Delete a static default route entry.
► Mode: Global Config Mode
► Privilege Level: Operator
► Format: ip default-route delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

113.6.10 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Track instance.</td>
</tr>
</tbody>
</table>
### 113.6.11 ip 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
</tbody>
</table>

### 113.6.12 ip 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
<tr>
<td>P-3</td>
<td>1-255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 113.6.13 ip 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
<tr>
<td>P-3</td>
<td>1-255</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 113.6.14 ip 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>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address</td>
</tr>
</tbody>
</table>

### 113.6.15 ip template

Select the routing template valid after the next reboot.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** `ip template <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>default</td>
<td>Reset to the default template</td>
</tr>
<tr>
<td></td>
<td>IPv4-Default</td>
<td>Default IPv4 routing template</td>
</tr>
<tr>
<td></td>
<td>IPv4-Datacenter</td>
<td>IPv4 datacenter routing template</td>
</tr>
<tr>
<td></td>
<td>IPv4-Unicast</td>
<td>IPv4 unicast only template</td>
</tr>
<tr>
<td></td>
<td>IPv4-Multicast</td>
<td>IPv4 multicast enhanced template</td>
</tr>
</tbody>
</table>

### 113.6.16 ip loopback add

Enable a loopback interface.

- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** `ip loopback add <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Enter the loopback id in the given range.</td>
</tr>
</tbody>
</table>
**113.6.17 ip loopback delete**
Disable a loopback interface.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ip loopback delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..8</td>
<td>Enter the loopback id in the given range.</td>
</tr>
</tbody>
</table>

**113.6.18 ip 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

**113.6.19 ip 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

**113.6.20 ip icmp rate-limit interval**
Configure ICMP rate limit interval in milliseconds.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ip icmp rate-limit interval <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..2147483647</td>
<td>configure the interval.</td>
</tr>
</tbody>
</table>

**113.6.21 ip icmp rate-limit burst-size**
Configure ICMP rate limit burst size.
- **Mode:** Global Config Mode
- **Privilege Level:** Operator
- **Format:** ip icmp rate-limit burst-size <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..200</td>
<td>configure the burst-size.</td>
</tr>
</tbody>
</table>

**113.6.22 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

**113.7 show**
Display device options and settings.
113.7.1 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

113.7.2 show ip route local
Display the local routes.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip route local

113.7.3 show ip route static
Display the static routes.
- **Mode:** Command is in all modes available.
- **Privilege Level:** Guest
- **Format:** show ip route static

113.7.4 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
<tr>
<td>P-2</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>

113.7.5 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

113.7.6 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>A.B.C.D</td>
<td>IP address.</td>
</tr>
</tbody>
</table>
114User Management

114.1 show
Display device options and settings.

114.1.1 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

114.1.2 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
115Users

115.1 users
Manage Users and User Accounts.

115.1.1 users add
Add a new user.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users add <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

115.1.2 users delete
Delete an existing user.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users delete <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

115.1.3 users enable
Enable user.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users enable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

115.1.4 users disable
Disable user.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users disable <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
</tbody>
</table>

115.1.5 users password
Change user password.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users password <P-1> [<P-2>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

115.1.6 users snmpv3 authentication
Specify authentication setting for a user.
  ▶ Mode: Global Config Mode
  ▶ Privilege Level: Administrator
  ▶ Format: users snmpv3 authentication <P-1> <P-2>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>md5</td>
<td>MD5 as SNMPv3 user authentication mode.</td>
</tr>
<tr>
<td></td>
<td>sha1</td>
<td>SHA1 as SNMPv3 user authentication mode.</td>
</tr>
</tbody>
</table>
115.1.7 users snmpv3 encryption
Specify encryption settings for a user.
- **Mode:** Global Config Mode
- **Privilege Level:** Administrator
- **Format:** users snmpv3 encryption <P-1> <P-2>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td></td>
<td>SNMPv3 encryption method is none. des</td>
</tr>
</tbody>
</table>

115.1.8 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

115.1.9 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]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 64 characters.</td>
</tr>
</tbody>
</table>

115.1.10 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

115.1.11 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>unlock</td>
<td>Unlock specific user. User can login again.</td>
</tr>
</tbody>
</table>

115.1.12 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>string</td>
<td>&lt;user&gt; User name (up to 32 characters).</td>
</tr>
<tr>
<td>P-2</td>
<td>enable</td>
<td>Enable the option. disable</td>
</tr>
</tbody>
</table>

115.2 show
Display device options and settings.
115.2.1 show users

Display the users and user accounts information.

- **Mode:** Command is in all modes available.
- **Privilege Level:** Administrator
- **Format:** show users
116 Virtual LAN (VLAN)

116.1 name

116.1.1 name
Assign a name to a VLAN
- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: name \(<P-1>\) \(<P-2>\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
<tr>
<td>P-2</td>
<td>string</td>
<td>Enter a user-defined text, max. 32 characters.</td>
</tr>
</tbody>
</table>

116.2 vlan-unaware-mode

116.2.1 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

116.3 vlan

Creation and configuration of VLANs.

116.3.1 vlan add
Create a VLAN
- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: vlan add \(<P-1>\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

116.3.2 vlan delete
Delete a VLAN
- Mode: VLAN Database Mode
- Privilege Level: Operator
- Format: vlan delete \(<P-1>\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>2..4042</td>
<td>Enter VLAN ID. VLAN ID 1 can not be deleted or created</td>
</tr>
</tbody>
</table>
### 116.4.1 vlan acceptframe
Configure how to handle tagged/untagged frames received.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan acceptframe <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>all</td>
<td>Untagged frames or priority frames received on this interface are accepted and assigned the value of the interface VLAN ID for this port.</td>
</tr>
<tr>
<td></td>
<td>vlanonly</td>
<td>Only frames received with a VLAN tag will be forwarded. All other frames will be dropped.</td>
</tr>
</tbody>
</table>

### 116.4.2 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`

### 116.4.3 vlan priority
Configure the priority for untagged frames.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan priority <P-1>`

### 116.4.4 vlan pvid
Configure the VLAN id for a specific port.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan pvid <P-1>`

### 116.4.5 vlan tagging
Enable or disable tagging for a specific VLAN port.
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan tagging <P-1>`

**no vlan tagging**
Disable the option
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `no vlan tagging <P-1>`

### 116.4.6 vlan participation include
vlan participation to include
- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `vlan participation include <P-1>`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1.4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>
116.4.7   vlan participation exclude

vlan participation to exclude
➤ Mode: Interface Range Mode
➤ Privilege Level: Operator
➤ Format: vlan participation exclude <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

116.4.8   vlan participation auto

vlan participation to auto
➤ Mode: Interface Range Mode
➤ Privilege Level: Operator
➤ Format: vlan participation auto <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

116.5   show

Display device options and settings.

116.5.1   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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

116.5.2   show vlan brief

Display the general VLAN parameters.
➤ Mode: Command is in all modes available.
➤ Privilege Level: Guest
➤ Format: show vlan brief

116.5.3   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>]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>

116.5.4   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

116.5.5   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

116.6   network

Configure the inband and outband connectivity.
### 116.6.1 network management vlan

Configure the management VLAN ID of the switch.

- **Mode**: Privileged Exec Mode
- **Privilege Level**: Operator
- **Format**: network management vlan <P-1>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>1..4042</td>
<td>Enter the VLAN ID.</td>
</tr>
</tbody>
</table>

### 116.6.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..7</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>

### 116.6.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..63</td>
<td>Enter a number in the given range.</td>
</tr>
</tbody>
</table>
Voice VLAN

117.1 voice
Configure voice VLAN.

117.1.1 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

117.2 voice
Configure voice VLAN.

117.2.1 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0..4042</td>
<td>Enter the VLAN ID. Entering of ID 0 disables the feature.</td>
</tr>
<tr>
<td>P-2</td>
<td>0</td>
<td>priority 0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>priority 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>priority 2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>priority 3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>priority 4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>priority 5</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>priority 6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>priority 7</td>
</tr>
<tr>
<td></td>
<td>255</td>
<td>default</td>
</tr>
</tbody>
</table>

117.2.2 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>0</td>
<td>priority 0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>priority 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>priority 2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>priority 3</td>
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<td></td>
<td>4</td>
<td>priority 4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>priority 5</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>priority 6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>priority 7</td>
</tr>
<tr>
<td></td>
<td>255</td>
<td>default</td>
</tr>
</tbody>
</table>
### 117.2.3 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>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td><code>&lt;0..63&gt;</code></td>
<td>Differentiated Services Code Point value.</td>
</tr>
<tr>
<td></td>
<td>af11</td>
<td>Match packets with AF11 dscp.</td>
</tr>
<tr>
<td></td>
<td>af12</td>
<td>Match packets with AF12 dscp.</td>
</tr>
<tr>
<td></td>
<td>af13</td>
<td>Match packets with AF13 dscp.</td>
</tr>
<tr>
<td></td>
<td>af21</td>
<td>Match packets with AF21 dscp.</td>
</tr>
<tr>
<td></td>
<td>af22</td>
<td>Match packets with AF22 dscp.</td>
</tr>
<tr>
<td></td>
<td>af23</td>
<td>Match packets with AF23 dscp.</td>
</tr>
<tr>
<td></td>
<td>af31</td>
<td>Match packets with AF31 dscp.</td>
</tr>
<tr>
<td></td>
<td>af32</td>
<td>Match packets with AF32 dscp.</td>
</tr>
<tr>
<td></td>
<td>af33</td>
<td>Match packets with AF33 dscp.</td>
</tr>
<tr>
<td></td>
<td>af41</td>
<td>Match packets with AF41 dscp.</td>
</tr>
<tr>
<td></td>
<td>af42</td>
<td>Match packets with AF42 dscp.</td>
</tr>
<tr>
<td></td>
<td>af43</td>
<td>Match packets with AF43 dscp.</td>
</tr>
<tr>
<td></td>
<td>cs1</td>
<td>Match packets with CS1 dscp.</td>
</tr>
<tr>
<td></td>
<td>cs2</td>
<td>Match packets with CS2 dscp.</td>
</tr>
<tr>
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<td>Match packets with CS3 dscp.</td>
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<td>Match packets with CS4 dscp.</td>
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<tr>
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<td>cs5</td>
<td>Match packets with CS5 dscp.</td>
</tr>
<tr>
<td></td>
<td>cs6</td>
<td>Match packets with CS6 dscp.</td>
</tr>
<tr>
<td></td>
<td>cs7</td>
<td>Match packets with CS7 dscp.</td>
</tr>
<tr>
<td></td>
<td>default</td>
<td>Match packets with default dscp.</td>
</tr>
<tr>
<td></td>
<td>ef</td>
<td>Match packets with EF dscp.</td>
</tr>
</tbody>
</table>

### 117.2.4 voice vlan none

Configure the none voice VLAN interface mode.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `voice vlan none`

### 117.2.5 voice vlan untagged

Configure the untagged voice VLAN interface mode.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `voice vlan untagged`

### 117.2.6 voice vlan disable

Disable voice VLAN on the interface.

- **Mode:** Interface Range Mode
- **Privilege Level:** Operator
- **Format:** `voice vlan disable`

### 117.2.7 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`

### 117.2.8 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>`
### 117.3 show

Display device options and settings.

#### 117.3.1 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`

#### 117.3.2 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>]`

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>trust</td>
<td>Trust data traffic on an interface.</td>
</tr>
<tr>
<td></td>
<td>untrust</td>
<td>Untrust data traffic on an interface.</td>
</tr>
<tr>
<td>P-1</td>
<td>slot no./port no.</td>
<td></td>
</tr>
</tbody>
</table>
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 www.hirschmann.com. A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at 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 doc.hirschmann.com.

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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:

<table>
<thead>
<tr>
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<th>Good</th>
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<th>Mediocre</th>
<th>Poor</th>
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</tr>
</tbody>
</table>

Did you discover any errors in this manual? If so, on what page?

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Suggestions for improvement and additional information:
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General comments:
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

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Company / Department:
____________________________________________________________________________

Name / Telephone number:
____________________________________________________________________________

Street:
____________________________________________________________________________
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- per mail to
  
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  Department 01RD-NT
  Stuttgarter Str. 45-51
  72654 Neckartenzlingen

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Zip code / City:

E-mail:

Date / Signature: