HIRSCHMANN
A BELDEN BRAND

# Reference Manual

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

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

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

# About this Manual

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

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

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

The “Command Line Interface” reference manual contains detailed information on using the Command Line Interface to operate the individual functions of the device.

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

# 1 Access Control List (ACL)

## 1.1 mac

Set MAC parameters.

### 1.1.1 mac acl add

Create a new MAC ACL
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10100 | `MAC ACL ID` |
| `P-2` | string | `Enter an ACL name, alphanumeric ASCII character string with 1 to 32 characters.` |

### 1.1.2 mac acl delete

Delete an existing MAC ACL.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10100 | `MAC ACL ID` |

### 1.1.3 mac acl assign

Assign a MAC ACL to a VLAN.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl assign <P-1> vlan <P-2> <P-3> <P-4>`

`vlan`: Specify a VLAN

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10100 | `MAC ACL ID` |
| `P-2` | 0..4095 | `Enter a VLAN ID in the given range.` |
| `P-3` | in | `Incoming traffic` |
| `P-4` | 1..4294967295 | `Sequence` |

### 1.1.4 mac acl deassign

Deassign a MAC ACL from a VLAN.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl deassign <P-1> vlan <P-2> <P-3> <P-4>`

`vlan`: Specify a VLAN

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10100 | `MAC ACL ID` |
| `P-2` | 0..4095 | `Enter a VLAN ID in the given range.` |
| `P-3` | in | `Incoming traffic` |
| `P-4` | 1..4294967295 | `Sequence` |

### 1.1.5 mac acl counter reset

Reset the counter for one or all MAC ACL rules.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl counter reset [<P-1>] [<P-2>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10100 | `MAC ACL ID` |
| `P-2` | 1..239 | `MAC ACL Rule ID` |

### 1.1.6 mac acl trapflag

Change the trap flag.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl trapflag <P-1>`

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

### 1.1.7 mac acl rule add

Add a rule to an existing MAC ACL.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl rule add <P-1> <P-2> permit src <P-3> <P-4> dst <P-5> <P-6> [etype <P-7>] [vlan <P-8>] [cos <P-9>] [log] deny src <P-10> <P-11> dst <P-12> <P-13> [etype <P-14>] [vlan <P-15>] [cos <P-16>] [log]`

`permit`: Add a permit rule.
`src`: Specify the src MAC address/mask.
`dst`: Specify the dst MAC address/mask.
`[etype]`: Ethertype
`[vlan]`: Specify a VLAN to match.
`[cos]`: Specify a COS to match.
`[log]`: Enable Logging
`deny`: Add a deny rule.
`src`: Specify the src MAC address/mask.
`dst`: Specify the dst MAC address/mask.
`[etype]`: Ethertype
`[vlan]`: Specify a VLAN to match.
`[cos]`: Specify a COS to match.
`[log]`: Enable Logging

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |
| P-2 | 1..239 | MAC ACL Rule ID |
| P-3 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-4 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC mask in hexadecimal format. The 'Don't care bits' are represented by binary 0's and 'Do care bits' are represented by binary 1's.. |
| P-5 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-6 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC mask in hexadecimal format. The 'Don't care bits' are represented by binary 0's and 'Do care bits' are represented by binary 1's.. |
| P-7 | 0x0600-0xffff | Ethertype value |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBM SNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX (old) |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | Novell |
| | pppoe-disc | PPPoE Discovery Stage |
| | rarp | RARP |
| | pppoe-sess | PPPoE Session Stage |
| | ipx-new | IPX (new) |
| | powerlink | POWERLINK |
| | profinet | PROFINET |
| | ethercat | EtherCAT |
| P-8 | 0..4095 | Enter a VLAN ID in the given range. |
| P-9 | 1..7 | Enter a COS in the given range. |

| Parameter | Value | Meaning |
|---|---|---|
| P-10 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-11 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC mask in hexadecimal format. The 'Don't care bits' are represented by binary 0's and 'Do care bits' are represented by binary 1's.. |
| P-12 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-13 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC mask in hexadecimal format. The 'Don't care bits' are represented by binary 0's and 'Do care bits' are represented by binary 1's.. |
| P-14 | 0x0600-0xffff | Ethertype value |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBM SNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX (old) |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | Novell |
| | pppoe-disc | PPPoE Discovery Stage |
| | rarp | RARP |
| | pppoe-sess | PPPoE Session Stage |
| | ipx-new | IPX (new) |
| | powerlink | POWERLINK |
| | profinet | PROFINET |
| | ethercat | EtherCAT |
| P-15 | 0..4095 | Enter a VLAN ID in the given range. |
| P-16 | 1..7 | Enter a COS in the given range. |

### 1.1.8 mac acl rule delete

Remove a rule from a MAC ACL.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac acl rule delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |
| P-2 | 1..239 | MAC ACL Rule ID |

## 1.2 ip

Set IP parameters.

### 1.2.1 ip acl add

Create a new IP ACL.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip acl add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | string | Enter an ACL name, alphanumeric ASCII character string with 1 to 32 characters. |

### 1.2.2 ip acl delete

Delete an existing IP ACL.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip acl delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |

### 1.2.3 ip acl assign

Assign an IP ACL to a VLAN.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip acl assign <P-1> vlan <P-2> <P-3> <P-4>

vlan: Specify a VLAN.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | vlan | Specify VLAN |
| P-3 | 0..4095 | Enter a VLAN ID in the given range. |
| P-4 | in | Incoming traffic |
| P-5 | 1..4294967295 | Sequence |

### 1.2.4 ip acl deassign

Remove an IP ACL from a VLAN.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip acl deassign <P-1> vlan <P-2> <P-3> <P-4>

vlan: Specify a VLAN.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | vlan | Specify VLAN |
| P-3 | 0..4095 | Enter a VLAN ID in the given range. |
| P-4 | in | Incoming traffic |
| P-5 | 1..4294967295 | Sequence |

### 1.2.5 ip acl counter reset

Reset the counter for one or all IP ACL rules.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip acl counter reset [<P-1>] [<P-2>]

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | 1..239 | IP ACL Rule ID |

### 1.2.6 ip acl trapflag

Change a trap flag.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip acl trapflag <P-1>

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

### 1.2.7 ip acl rule add

Add a rule to an existing IP ACL.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip acl rule add <P-1> <P-2> permit src <P-3> <P-4> [sport <P-5>] dst <P-6> <P-7> [dport <P-8>] [proto <P-9>] [fragments] [log] [dscp <P-10>] [mirror <P-11>] [redirect <P-12>] [rate-limit <P-13> <P-14> <P-15>] [tos <P-16> <P-17>] [mirror <P-18>] [redirect <P-19>] [rate-limit <P-20> <P-21> <P-22>] [precedence <P-23>] [mirror <P-24>] [redirect <P-25>] [rate-limit <P-26> <P-27> <P-28>] deny src <P-29> <P-30> [sport <P-31>] dst <P-32> <P-33> [dport <P-34>] [proto <P-35>] [fragments] [log] [dscp <P-36>] [tos <P-37> <P-38>] [precedence <P-39>]

permit: Add a permit rule to an existing IP ACL.
src: Specify the source IP/mask.
[sport]: Specify the source L4 port.

dst: Specify the destination IP/mask.
[dport]: Specify the destination L4 port.
[proto]: Specify the protocol.
[fragments]: Match non-initial fragments
[log]: Enable Logging
[dscp]: Specify the DSCP.
[mirror]: Specify the mirror port.
[redirect]: Specify the redirect port.
[rate-limit]: Specify the rate limit and burst size.
[tos]: Specify the TOS.
[mirror]: Specify a mirror port.
[redirect]: Specify the redirect port.
[rate-limit]: Specify the rate limit and burst size.
[precedence]: Specify the IP precedence.
[mirror]: Specify the mirror port.
[redirect]: Specify the redirect port.
[rate-limit]: Specify the rate limit and burst size.
deny: Add a deny rule to an existing IP ACL.
src: Specify the source IP/mask.
[sport]: Specify the source L4 port.
dst: Specify the destination IP/mask.
[dport]: Specify the destination L4 port.
[proto]: Specify a protocol.
[fragments]: Match non-initial fragments
[log]: Enable Logging
[dscp]: Specify the DSCP.
[tos]: Specify the TOS.
[precedence]: Specify the IP precedence.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | 1..239 | IP ACL Rule ID |
| P-3 | any | Enter 'any' to match any ip address. |
| | a.b.c.d | Enter the IP address to match. |
| P-4 | any | Enter 'any' to match any ip mask. |
| | a.b.c.d | Enter an IP mask to match. The 'Don't care bits' are represented by binary 1's and 'Do care bits' are represented by binary 0's.. |
| P-5 | domain | Domain |
| | echo | Echo |
| | ftp | FTP |
| | ftpdata | FTP Data |
| | http | HTTP |
| | https | HTTPS |
| | smtp | SMTP |
| | snmp | SNMP |
| | telnet | Telnet |
| | ssh | SSH |
| | tftp | TFTP |
| | www | WWW |
| | 1-65535 | Port number |
| P-6 | any | Enter 'any' to match any ip address. |
| | a.b.c.d | Enter the IP address to match. |
| P-7 | any | Enter 'any' to match any ip mask. |
| | a.b.c.d | Enter an IP mask to match. The 'Don't care bits' are represented by binary 1's and 'Do care bits' are represented by binary 0's.. |

| Parameter | Value | Meaning |
|---|---|---|
| P-8 | domain | Domain |
| | echo | Echo |
| | ftp | FTP |
| | ftpdata | FTP Data |
| | http | HTTP |
| | https | HTTPS |
| | smtp | SMTP |
| | snmp | SNMP |
| | telnet | Telnet |
| | ssh | SSH |
| | tftp | TFTP |
| | www | WWW |
| | 1-65535 | Port number |
| P-9 | 1-255 | Enter a protocol number. |
| | icmp | Match the ICMP protocol. |
| | igmp | Match the IGMP protocol |
| | ip | Match the IPinIP tunnel. |
| | tcp | Match the TCP protocol. |
| | udp | Match the UDP protocol. |
| P-10 | 1..63 | DSCP |
| P-11 | slot/port | Enter a single interface in slot/port format. |
| P-12 | slot/port | Enter a single interface in slot/port format. |
| P-13 | 0..10000000 | Committed rate value, specified in kbps or pps |
| P-14 | 0..128 | Committed burst size value, specified in kbytes or pps |
| P-15 | pps | Packets per second. |
| | kbps | kbytes per second. |
| P-16 | 1..31 | Specify the IP TOS bits to match. |
| P-17 | 1..31 | Specify the IP TOS bits that are of interest. |
| P-18 | slot/port | Enter a single interface in slot/port format. |
| P-19 | slot/port | Enter a single interface in slot/port format. |
| P-20 | 0..10000000 | Committed rate value, specified in kbps or pps |
| P-21 | 0..128 | Committed burst size value, specified in kbytes or pps |
| P-22 | pps | Packets per second. |
| | kbps | kbytes per second. |
| P-23 | 1..7 | IP Precedence |
| P-24 | slot/port | Enter a single interface in slot/port format. |
| P-25 | slot/port | Enter a single interface in slot/port format. |
| P-26 | 0..10000000 | Committed rate value, specified in kbps or pps |
| P-27 | 0..128 | Committed burst size value, specified in kbytes or pps |
| P-28 | pps | Packets per second. |
| | kbps | kbytes per second. |
| P-29 | any | Enter 'any' to match any ip address. |
| | a.b.c.d | Enter the IP address to match. |
| P-30 | any | Enter 'any' to match any ip mask. |
| | a.b.c.d | Enter an IP mask to match. The 'Don't care bits' are represented by binary 1's and 'Do care bits' are represented by binary 0's.. |
| P-31 | domain | Domain |
| | echo | Echo |
| | ftp | FTP |
| | ftpdata | FTP Data |
| | http | HTTP |
| | https | HTTPS |
| | smtp | SMTP |
| | snmp | SNMP |
| | telnet | Telnet |
| | ssh | SSH |
| | tftp | TFTP |
| | www | WWW |
| | 1-65535 | Port number |
| P-32 | any | Enter 'any' to match any ip address. |
| | a.b.c.d | Enter the IP address to match. |
| P-33 | any | Enter 'any' to match any ip mask. |
| | a.b.c.d | Enter an IP mask to match. The 'Don't care bits' are represented by binary 1's and 'Do care bits' are represented by binary 0's.. |

| Parameter | Value | Meaning |
|---|---|---|
| P-34 | domain | Domain |
| | echo | Echo |
| | ftp | FTP |
| | ftpdata | FTP Data |
| | http | HTTP |
| | https | HTTPS |
| | smtp | SMTP |
| | snmp | SNMP |
| | telnet | Telnet |
| | ssh | SSH |
| | tftp | TFTP |
| | www | WWW |
| | 1-65535 | Port number |
| P-35 | 1-255 | Enter a protocol number. |
| | icmp | Match the ICMP protocol. |
| | igmp | Match the IGMP protocol |
| | ip | Match the IPinIP tunnel. |
| | tcp | Match the TCP protocol. |
| | udp | Match the UDP protocol. |
| P-36 | 1..63 | DSCP |
| P-37 | 1..31 | Specify the IP TOS bits to match. |
| P-38 | 1..31 | Specify the IP TOS bits to match. |
| P-39 | 1..7 | IP Precedence |

### 1.2.8 ip acl rule delete

Delete a rule from an IP ACL.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip acl rule delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | 1..239 | IP ACL Rule ID |

## 1.3 show

Display device options and settings.

### 1.3.1 show access-list trapflag

Display the trap flag status.

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

### 1.3.2 show access-list mac rules

Display the rules of a specific MAC ACL.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |
| P-2 | 1..239 | MAC ACL Rule ID |

### 1.3.3 show access-list mac lists

Display an overview of the existing MAC ACLs.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |

### 1.3.4 show access-list mac counters

Display the counters of a specific MAC ACL.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |
| P-2 | 1..239 | MAC ACL Rule ID |

### 1.3.5 show access-list mac assignment

Display the assignments of the existing MAC ACLs.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | MAC ACL ID |

### 1.3.6 show access-list ip rules

Display the rules of a specific IP ACL.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | 1..239 | IP ACL Rule ID |

### 1.3.7 show access-list ip lists

Display an overview of the existing IP ACLs.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |

### 1.3.8 show access-list ip counters

Display the counters of a specific IP ACL.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |
| P-2 | 1..239 | IP ACL Rule ID |

### 1.3.9 show access-list ip assignment

Display the assignments of the existing IP ACLs.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10100 | IP ACL ID |

# 2 Application Lists

## 2.1 appllists

Configure an application list.

### 2.1.1 appllists set-authlist

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

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

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

### 2.1.2 appllists enable

Activate a login application list.

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

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

### 2.1.3 appllists disable

Deactivate a login application list.

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

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

## 2.2 show

Display device options and settings.

### 2.2.1 show appllists

Display the ordered methods for application lists.

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

# 3 Asset

## 3.1 asset

Asset configuration.

### 3.1.1 asset add

Add an asset configuration to the asset table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `asset add <P-1> name <P-2> [description <P-3>] [type <P-4>] [manufacturer <P-5>] [model <P-6>] [general-location <P-7>] [specific-location <P-8>] [tag <P-9>] [ip-address <P-10>] [mac-address <P-11>] tag <P-12> [ip-address <P-13>] [mac-address <P-14>]`

`name`: Specify the Asset Name
`[description]`: Specify the Asset Description
`[type]`: Specify the Asset Type
`[manufacturer]`: Specify the Asset Manufacturer
`[model]`: Specify the Asset Model
`[general-location]`: Specify the Asset General Location
`[specific-location]`: Specify the Asset Specific Location
`[tag]`: Specify the Asset Tag
`[ip-address]`: Specify the IPv4 Address of asset/CIDR/'any'
`[mac-address]`: Specify the MAC address/'any'
`tag`: Specify the Asset Tag
`[ip-address]`: Specify the IPv4 Address/CIDR/'any'
`[mac-address]`: Specify the MAC address/'any'

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Asset Index |
| P-2 | string | Asset name |
| P-3 | string | Asset description |
| P-4 | computer | Computer Asset Type |
| | controller | Controller Asset Type |
| | device | Device Asset Type |
| | network | Network Asset Type |
| | network-Equipment | Network Equipment Asset Type |
| | broadcast | Broadcast Asset Type |
| | multicast | Multicast Asset Type |
| P-5 | string | Asset Manufacturer |
| P-6 | string | Asset Model |
| P-7 | string | Asset General Location |
| P-8 | string | Asset Specific Location |
| P-9 | string | Asset Tag |
| P-10 | any | Any address |
| | a.b.c.d | IP Address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | Everything BUT this address |
| | !a.b.c.d/n | Everything BUT this CIDR mask |
| P-11 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-12 | string | Asset Tag (internal or external) |
| P-13 | any | any  Any address |
| | a.b.c.d | IP Address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | Everything BUT this address |
| | !a.b.c.d/n | Everything BUT this CIDR mask |
| P-14 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |

### 3.1.2 asset modify

Modifies an asset configuration present in the asset table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `asset modify <P-1> [name <P-2>] [description <P-3>] [type <P-4>] [manufacturer <P-5>] [model <P-6>] [general-location <P-7>] [specific-location <P-8>] [tag <P-9>] [ip-address <P-10>] [mac-address <P-11>] [tag <P-12>] [ip-address <P-13>] [mac-address <P-14>]`

`[name]`: Specify the Asset Name
`[description]`: Specify the Asset Description
`[type]`: Specify the Asset Type
`[manufacturer]`: Specify the Asset Manufacturer
`[model]`: Specify the Asset Model
`[general-location]`: Specify the Asset General Location
`[specific-location]`: Specify the Asset Specific Location
`[tag]`: Specify the Asset Tag
`[ip-address]`: Specify the IPv4 Address of asset/CIDR/'any'
`[mac-address]`: Specify the MAC address/'any'
`[tag]`: Specify the Asset Tag
`[ip-address]`: Specify the IPv4 Address/CIDR/'any'
`[mac-address]`: Specify the MAC address/'any'

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Asset Index |
| P-2 | string | Asset name |
| P-3 | string | Asset description |
| P-4 | computer | Computer Asset Type |
| | controller | Controller Asset Type |
| | device | Device Asset Type |
| | network | Network Asset Type |
| | network-Equipment | Network Equipment Asset Type |
| | broadcast | Broadcast Asset Type |
| | multicast | Multicast Asset Type |
| P-5 | string | Asset Manufacturer |
| P-6 | string | Asset Model |
| P-7 | string | Asset General Location |
| P-8 | string | Asset Specific Location |
| P-9 | string | Asset Tag |
| P-10 | any | any  Any address |
| | a.b.c.d | IP Address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | Everything BUT this address |
| | !a.b.c.d/n | Everything BUT this CIDR mask |
| P-11 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-12 | string | Asset Tag (internal or external) |
| P-13 | any | any  Any address |
| | a.b.c.d | IP Address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | Everything BUT this address |
| | !a.b.c.d/n | Everything BUT this CIDR mask |
| P-14 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |

### 3.1.3 asset delete

Delete an asset configuration present in the asset table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `asset delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Asset Index |

## 3.2 show

Display device options and settings.

### 3.2.1 show asset list

Display list for all the configured assets.

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

# 4 Authentication Lists

## 4.1 authlists

Configure an authentication list.

### 4.1.1 authlists add

Create a new login authentication list.

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

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

### 4.1.2 authlists delete

Delete an existing login authentication list.

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

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

### 4.1.3 authlists set-policy

Set the policies of a login authentication list.

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

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

### 4.1.4 authlists enable

Activate a login authentication list.

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

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

### 4.1.5 authlists disable

Deactivate a login authentication list.

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

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

## 4.2 show

Display device options and settings.

### 4.2.1 show authlists

Display the ordered methods for authentication lists.

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

# 5 Class Of Service

## 5.1 classofservice

Class of service configuration.

### 5.1.1 classofservice dot1p-mapping

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

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

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

## 5.2 show

Display device options and settings.

### 5.2.1 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`

# 6 Command Line Interface (CLI)

## 6.1 cli

Set the CLI preferences.

### 6.1.1 cli serial-timeout

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

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

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

### 6.1.2 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>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | 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 |

### 6.1.3 cli numlines

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

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

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

### 6.1.4 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`

### 6.1.5 cli banner text

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

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

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

## 6.2 show

Display device options and settings.

### 6.2.1 show cli global

Display the CLI preferences.

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

### 6.2.2 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`

## 6.3 logging

Logging configuration.

### 6.3.1 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`

## 6.4 show

Display device options and settings.

### 6.4.1 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`

# 7 Clock

## 7.1 clock

Configure local and DST clock settings.

### 7.1.1 clock set

Edit current local time.

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

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

### 7.1.2 clock timezone offset

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

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

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

### 7.1.3 clock timezone zone

Edit the timezone acronym (max. 4 characters).

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

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

### 7.1.4 clock summer-time mode

Configure summer-time mode parameters.

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

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

### 7.1.5 clock summer-time recurring start

Edit the starting date and time for daylight saving time.

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

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

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

### 7.1.6 clock summer-time recurring end

Edit the ending date and time for daylight saving time.

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

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

### 7.1.7 clock summer-time zone

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

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

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

## 7.2 show

Display device options and settings.

### 7.2.1 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.

# 8 Configuration

## 8.1 save

Save the configuration to the specified destination.

### 8.1.1 save profile

Save the configuration to the specific profile.
- Mode: `All Privileged Modes`
- Privilege Level: `Operator`
- Format: `save profile <P-1>`

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

## 8.2 config

Configure the configuration saving settings.

### 8.2.1 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`

### 8.2.2 config watchdog timeout

Configure the configuration undo timeout (unit: seconds).
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `config watchdog timeout <P-1>`

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

### 8.2.3 config encryption password set

Set the configuration file password.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `config encryption password set [<P-1>] [<P-2>]`

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

### 8.2.4 config encryption password clear

Clear the configuration file password.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `config encryption password clear [<P-1>]`

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

### 8.2.5 config envm choose-active

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

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

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

### 8.2.6 config envm log-device

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

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

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

### 8.2.7 config envm auto-update

Allow automatic firmware updates with this memory device.

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

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

**no config envm auto-update**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no config envm auto-update <P-1>`

### 8.2.8 config envm config-save

Allow the configuration to be saved to this memory device.

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

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

**no config envm config-save**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no config envm config-save <P-1>`

### 8.2.9 config envm load-priority

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

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

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

### 8.2.10 config profile select

Select a configuration profile to be the active configuration.

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

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

### 8.2.11 config profile delete

Delete a specific configuration profile.

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

`num`: Select the index of a profile to delete.
`profile`: Select the name of a profile to delete.

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

### 8.2.12 config fingerprint verify nvm profile

Select the name of a profile to be verified.

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

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

### 8.2.13 config fingerprint verify nvm num

Select the index number of a profile to be verified.

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

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

### 8.2.14 config fingerprint verify envm profile

Select the name of a profile to be verified.

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

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

### 8.2.15 config fingerprint verify envm num

Select the index number of a profile to be verified.

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

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

## 8.3 copy

Copy different kinds of items.

### 8.3.1 copy sysinfo system envm

Copy the system information to external non-volatile memory.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `copy sysinfo system envm [filename <P-1>]`

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

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

### 8.3.2 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`

### 8.3.3 copy firmware envm

Copy a firmware image to the device from external non-volatile memory.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `copy firmware envm <P-1> system`

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

### 8.3.4 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`

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

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

### 8.3.5 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.

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

### 8.3.6 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>`

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

### 8.3.7 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>`

`[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.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |
| `P-2` | string | `Enter a user-defined text, max. 128 characters.` |

### 8.3.8 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.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

### 8.3.9 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>] running-config`

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | `Enter a user-defined text, max. 128 characters.` |
| `P-2` | string | `Enter a user-defined text, max. 32 characters.` |

## 8.4 clear

Clear several items.

### 8.4.1 clear config

Clear the running configuration.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear config`

### 8.4.2 clear factory

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

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear factory`

### 8.4.3 clear sfp-white-list

Clear the SFP WhiteList.

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

## 8.5 show

Display device options and settings.

### 8.5.1 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`

### 8.5.2 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] [interface <P-1>]`

`[all]`: Display the currently running configuration (CLI script).
`[interface]`: Display the currently running configuration for the interface (Partial CLI script).

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

## 8.6 show

Display device options and settings.

### 8.6.1 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`

### 8.6.2 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`

### 8.6.3 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`

### 8.6.4 show config watchdog

Display the Auto Configuration Undo settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show config watchdog`

### 8.6.5 show config encryption

Display the settings for configuration encryption.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show config encryption`

### 8.6.6 show config profiles

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

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

### 8.6.7 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`

## 8.7 swap

Swap software images.

### 8.7.1 swap firmware system backup

Swap the main and backup images.

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

# 9 Device Monitoring

## 9.1 device-status

Configure various device conditions to be monitored.

### 9.1.1 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`

### 9.1.2 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`

### 9.1.3 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`

### 9.1.4 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`

### 9.1.5 device-status monitor power-supply

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

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

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

**no device-status monitor power-supply**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no device-status monitor power-supply <P-1>`

### 9.1.6 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`

## 9.2 device-status

Configure various device conditions to be monitored.

### 9.2.1 device-status link-alarm

Configure the monitor settings of the port link.

- Mode: `Interface Range Mode`
- Privilege Level: `Administrator`
- Format: `device-status link-alarm`

**no device-status link-alarm**

Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Administrator`
- Format: `no device-status link-alarm`

## 9.3 show

Display device options and settings.

### 9.3.1 show device-status monitor

Display the device monitoring configurations.

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

### 9.3.2 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`

### 9.3.3 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`

### 9.3.4 show device-status events

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

### 9.3.5 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`

### 9.3.6 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`

# 10 Device Security

## 10.1 security-status

Configure the security status settings.

### 10.1.1 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`

### 10.1.2 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`

### 10.1.3 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`

### 10.1.4 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`

### 10.1.5 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`

### 10.1.6 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`

### 10.1.7 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`

### 10.1.8 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`

### 10.1.9 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`

### 10.1.10 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`

### 10.1.11 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`

### 10.1.12 security-status monitor https-certificate

Sets the monitoring whether auto generated self-signed HTTPS certificate is in use.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `security-status monitor https-certificate`

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

### 10.1.13 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`

## 10.2 security-status

Configure the security status interface settings.

### 10.2.1 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`

## 10.3 show

Display device options and settings.

### 10.3.1 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`

### 10.3.2 show security-status state

Display the current security status.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show security-status state`

### 10.3.3 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`

### 10.3.4 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`

### 10.3.5 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`

### 10.3.6 show security-status all

Display the security status settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show security-status all`

# 11 Dynamic Host Configuration Protocol (DHCP)

## 11.1 dhcp-server

Modify DHCP Server parameters.

### 11.1.1 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`

**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> interface <P-4> static <P-5> interface <P-6>`

`dynamic`: Add a pool with one or more IP addresses.
`interface`: Interface mode.
`static`: Add a pool with only one IP address. This is the same as the 'dynamic' command with last-ip set to '0.0.0.0'.
`interface`: Interface mode.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..128 | `Pool ID.` |
| `P-2` | A.B.C.D | `IP address` |
| `P-3` | A.B.C.D | `IP address` |
| `P-4` | slot no./port no. | |
| `P-5` | A.B.C.D | `IP address` |
| `P-6` | slot no./port no. | |

**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> leasetime <P-6> option gateway <P-7> netmask <P-8> dns <P-9> hostname <P-10>`

`first-ip`: Modify the first IP.
`last-ip`: Modify the last IP.
`mode`: Pool mode settings.
`interface`: Interface mode.
`mac`: MAC mode.
`leasetime`: Enter the leasetime in seconds.
`option`: Configuration option.
`gateway`: Default gateway.
`netmask`: Option netmask.
`dns`: Option dns.
`hostname`: Option hostname.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-4 | slot no./port no. | |
| P-5 | any | Enter any as a shortcut for the MAC address 00:00:00:00:00:00. |
| | aa:bb:cc:dd:ee:ff | Enter the MAC address in hexadecimal format. |
| P-6 | infinite | Infinite leasetime. |
| | 60..220752000 | Leasetime in seconds. |
| P-7 | A.B.C.D | IP address. |
| P-8 | A.B.C.D | IP address. |
| P-9 | A.B.C.D | IP address. |
| P-10 | string | Enter a user-defined text, max. 64 characters. |

**dhcp-server pool mode**

Pool enable.

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

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

no dhcp-server pool mode

Disable the option

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

**dhcp-server pool delete**

Pool delete.

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

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

## 11.2 show

Display device options and settings.

### 11.2.1 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

### 11.2.2 show dhcp-server pool

Display the DHCP Server pool entries.

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

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

### 11.2.3 show dhcp-server interface

Display the DHCP server information per interface.

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

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

### 11.2.4 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`

# 12 Domain Name System (DNS)

## 12.1 dns

Set DNS parameters.

### 12.1.1 dns caching-server adminstate

Enable or disable the DNS Caching Server.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dns caching-server adminstate`

**no dns caching-server adminstate**
Disable the option
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no dns caching-server adminstate`

### 12.1.2 dns caching-server flush

Flush the DNS cache.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dns caching-server flush <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | action | `Flush the DNS cache.` |

### 12.1.3 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`

### 12.1.4 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`

### 12.1.5 dns client servers add

Add a new DNS server.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dns client servers add <P-1> ip <P-2>`

`ip`: Enter the DNS server address.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | DNS Client servers index. |
| P-2 | A.B.C.D | IP address. |

### 12.1.6 dns client servers delete

Delete a DNS server.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client servers delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | DNS Client servers index. |

### 12.1.7 dns client servers modify

Modify a DNS server entry.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client servers modify <P-1> ip <P-2> status <P-3> operation <P-4>

ip: Change the DNS server address.
status: Change the status of this DNS server.
operation: Change the status of this DNS server.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | DNS Client servers index. |
| P-2 | A.B.C.D | IP address. |
| P-3 | enable | Enable the option. |
| | disable | Disable the option. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |

### 12.1.8 dns client servers enable

Activate a DNS server entry.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client servers enable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | DNS Client servers index. |

### 12.1.9 dns client servers disable

Deactivate a DNS server entry.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client servers disable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | DNS Client servers index. |

### 12.1.10 dns client timeout

Set the timeout before retransmitting a request to the server.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client timeout <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..3600 | The timeout before retransmitting a request to the server (default: 3). |

### 12.1.11 dns client retry

Set the number of times the request is retransmitted.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dns client retry <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..100 | The number of times the request is retransmitted (default: 2). |

## 12.2 show

Display device options and settings.

### 12.2.1 show dns caching-server info

Display the DNS Caching Server information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dns caching-server info`

### 12.2.2 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`

### 12.2.3 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`

### 12.2.4 show dns client servers

Display the DNS Client servers.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dns client servers`

# 13 DoS Mitigation

## 13.1 dos

Manage DoS Mitigation

### 13.1.1 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`

### 13.1.2 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`

### 13.1.3 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`

### 13.1.4 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`

### 13.1.5 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`

### 13.1.6 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`

### 13.1.7 dos icmp payload-size

Configures maximum ICMP payload size (default: 512).
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dos icmp payload-size <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..1472 | `Max. ICMP payload size (default: 512)` |

### 13.1.8 dos ip-land

Enables LAND attack protection - source IP equals destination IP.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dos ip-land <P-1>`

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

### 13.1.9 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`

### 13.1.10 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`

### 13.1.11 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`

### 13.1.12 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`

### 13.1.13 dos l2-frame-forwarding

Enables L2 802.3 frame forwarding.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dos l2-frame-forwarding`

- **no dos l2-frame-forwarding**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no dos l2-frame-forwarding`

## 13.2 show

Display device options and settings.

### 13.2.1 show dos

Display the DoS Mitigation parameters.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dos`

# 14 Deep Packet Inspection (DPI)

## 14.1 dpi

Creation and configuration of DPI profiles.

### 14.1.1 dpi modbus commit

Writes all changes made in the DPI MODBUS profiles to the enforcer.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi modbus commit`

### 14.1.2 dpi modbus addprofile

Adds a profile to the DPI MODBUS profile table.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi modbus addprofile <P-1> [description <P-2>] [function-type <P-3>] [function-code-list <P-4>] [unit-identifier-list <P-5>] [sanity-check <P-6>] [exception <P-7>] [reset <P-8>]`

`[description]`: Profile description/name for the DPI MODBUS profile.
`[function-type]`: Function type of corresponding function codes.
`[function-code-list]`: Function code list. A function code has the syntax 'val'. Function codes are separated by a comma. When more than one value for an function code is specified the values are separated by the pipe symbol ('|').
`[unit-identifier-list]`: Unit identifier list. A unit identifier has the syntax 'val'. To specify no options, the value 'none' must be given. Unit identifiers are separated by a comma.
`[sanity-check]`: Sanity check including format and specification.
`[exception]`: Device exception message.
`[reset]`: Reset connection message.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index 1 - 32` |
| `P-2` | string | `Profile description/name` |
| `P-3` | readonly | `Read only function codes for function code list` |
| | readwrite | `Read write function codes for function code list` |
| | programming | `Programming function codes for function code list` |
| | all | `All possible function codes for function code list (allow any function code)` |
| | advanced | `Keeps the function code list from the previous selection and makes it editable by the user` |

| Parameter | Value | Meaning |
|---|---|---|
| P-4 | 1..255 | Function codes 1 - 255 |
| | 1\|0-65535 | Function code read coils, coil address range 0 - 65535 |
| | 2\|0-65535 | Function code read discrete inputs, input address range 0 - 65535 |
| | 3\|0-65535 | Function code read holding registers, register address range 0 - 65535 |
| | 4\|0-65535 | Function code read input registers, register address range 0 - 65535 |
| | 5\|0-65535 | Function code write single coil, coil address range 0 - 65535 |
| | 6\|0-65535 | Function code write single register, register address range 0 - 65535 |
| | 7 | Function code read exception status |
| | 8 | Function code diagnostic |
| | 11 | Function code get com event counter |
| | 12 | Function code get comm event log |
| | 13 | Function code program (584/984) |
| | 14 | Function code poll (584/984) |
| | 15\|0-65535 | Function code write multiple coils, coil address range 0 - 65535 |
| | 16\|0-65535 | Function code write multiple registers, register address range 0 - 65535 |
| | 17 | Function code report slave id |
| | 20 | Function code read file record |
| | 21 | Function code write file record |
| | 22\|0-65535 | Function code mask write register, register address range 0 - 65535 |
| | 23\|0-65535\|0-65535 | Function code read/write multiple registers, read address range 0 - 65535, write address range 0 - 65535 |
| | 24\|0-65535 | Function code read fifo queue, pointer address range 0 - 65535 |
| | 40 | Function code program (concept) |
| | 42 | Function code concept symbol table |
| | 43 | Function code encapsulated interface transport |
| | 48 | Function code advantech co. ltd. - management functions |
| | 66 | Function code scan data inc. - expanded read holding registers |
| | 67 | Function code scan data inc. - expanded write holding registers |
| | 90 | Function code unity programming/ofs |
| | 100 | Function code scattered register read |
| | 125 | Function code schneider electric - firmware replacement |
| | 126 | Function code schneider electric - program |
| P-5 | 0..255 | Unit identifier 0 - 255 |
| | none | No unit identifier 'none' |
| P-6 | yes | True |
| | no | False |
| P-7 | yes | True |
| | no | False |
| P-8 | yes | True |
| | no | False |

### 14.1.3 dpi modbus modifyprofile

Modifies a profile in the DPI MODBUS profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi modbus modifyprofile <P-1> [description <P-2>] [function-type <P-3>] [function-code-list <P-4>] [unit-identifier-list <P-5>] [sanity-check <P-6>] [exception <P-7>] [reset <P-8>]`

`[description]`: Profile description/name for the DPI MODBUS profile.
`[function-type]`: Function type of corresponding function codes.
`[function-code-list]`: Function code list. A function code has the syntax 'val'. Function codes are separated by a comma. When more than one value for an function code is specified the values are separated by the pipe symbol ('|').
`[unit-identifier-list]`: Unit identifier list. A unit identifier has the syntax 'val'. To specify no options, the value 'none' must be given. Unit identifiers are separated by a comma.
`[sanity-check]`: Sanity check including format and specification.
`[exception]`: Device exception message.
`[reset]`: Reset connection message.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |
| P-2 | string | Profile description/name |

| Parameter | Value | Meaning |
|---|---|---|
| P-3 | readonly | Read only function codes for function code list |
| | readwrite | Read write function codes for function code list |
| | programming | Programming function codes for function code list |
| | all | All possible function codes for function code list (allow any function code) |
| | advanced | Keeps the function code list from the previous selection and makes it editable by the user |
| P-4 | 1..255 | Function codes 1 - 255 |
| | 1\|0-65535 | Function code read coils, coil address range 0 - 65535 |
| | 2\|0-65535 | Function code read discrete inputs, input address range 0 - 65535 |
| | 3\|0-65535 | Function code read holding registers, register address range 0 - 65535 |
| | 4\|0-65535 | Function code read input registers, register address range 0 - 65535 |
| | 5\|0-65535 | Function code write single coil, coil address range 0 - 65535 |
| | 6\|0-65535 | Function code write single register, register address range 0 - 65535 |
| | 7 | Function code read exception status |
| | 8 | Function code diagnostic |
| | 11 | Function code get com event counter |
| | 12 | Function code get comm event log |
| | 13 | Function code program (584/984) |
| | 14 | Function code poll (584/984) |
| | 15\|0-65535 | Function code write multiple coils, coil address range 0 - 65535 |
| | 16\|0-65535 | Function code write multiple registers, register address range 0 - 65535 |
| | 17 | Function code report slave id |
| | 20 | Function code read file record |
| | 21 | Function code write file record |
| | 22\|0-65535 | Function code mask write register, register address range 0 - 65535 |
| | 23\|0-65535\|0-65535 | Function code read/write multiple registers, read address range 0 - 65535, write address range 0 - 65535 |
| | 24\|0-65535 | Function code read fifo queue, pointer address range 0 - 65535 |
| | 40 | Function code program (concept) |
| | 42 | Function code concept symbol table |
| | 43 | Function code encapsulated interface transport |
| | 48 | Function code advantech co. ltd. - management functions |
| | 66 | Function code scan data inc. - expanded read holding registers |
| | 67 | Function code scan data inc. - expanded write holding registers |
| | 90 | Function code unity programming/ofs |
| | 100 | Function code scattered register read |
| | 125 | Function code schneider electric - firmware replacement |
| | 126 | Function code schneider electric - program |
| P-5 | 0..255 | Unit identifier 0 - 255 |
| | none | No unit identifier 'none' |
| P-6 | yes | True |
| | no | False |
| P-7 | yes | True |
| | no | False |
| P-8 | yes | True |
| | no | False |

### 14.1.4 dpi modbus copyprofile

Copies a profile to another DPI MODBUS profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi modbus copyprofile <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile source index 1 - 32 |
| P-2 | 1..32 | Profile destination index 1 - 32 |

### 14.1.5 dpi modbus delprofile

Deletes a profile from the DPI MODBUS profile table. You cannot delete an active profile or if an enforcer mappings to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi modbus delprofile <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.6 dpi modbus enableprofile

Enables a profile in the DPI MODBUS profile table. A profile can only be activated when all required parameters are set. After activation modifications no longer possible.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi modbus enableprofile <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.7 dpi modbus disableprofile

Disables a profile in the DPI MODBUS profile table. You cannot inactivate a profile if an active enforcer mappings to it.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi modbus disableprofile <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.8 dpi opc commit

Writes all changes made in the DPI OPC profiles to the enforcer.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc commit

### 14.1.9 dpi opc addprofile

Adds a profile to the DPI OPC profile table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc addprofile <P-1> [description <P-2>] [sanity-check <P-3>] [fragment-check <P-4>] [timeout-connect <P-5>]

[description]: Profile description/name for the DPI OPC profile.
[sanity-check]: Sanity check including format and specification.
[fragment-check]: Fragment check.
[timeout-connect]: Timeout at connect.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |
| P-2 | string | Profile description/name |
| P-3 | yes | True |
| | no | False |
| P-4 | yes | True |
| | no | False |
| P-5 | 0..300 | Timeout in seconds 0 - 300 |

### 14.1.10 dpi opc modifyprofile

Modifies a profile in the DPI OPC profile table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc modifyprofile <P-1> [description <P-2>] [sanity-check <P-3>] [fragment-check <P-4>] [timeout-connect <P-5>]

[description]: Profile description/name for the DPI OPC profile.
[sanity-check]: Sanity check including format and specification.
[fragment-check]: Fragment check.
[timeout-connect]: Timeout at connect.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |
| P-2 | string | Profile description/name |
| P-3 | yes | True |
| | no | False |

| Parameter | Value | Meaning |
|---|---|---|
| P-4 | yes | True |
| | no | False |
| P-5 | 0..300 | Timeout in seconds 0 - 300 |

### 14.1.11 dpi opc copyprofile

Copies a profile to another DPI OPC profile.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc copyprofile <P-1> <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile source index 1 - 32 |
| P-2 | 1..32 | Profile destination index 1 - 32 |

### 14.1.12 dpi opc delprofile

Deletes a profile from the DPI OPC profile table. You cannot delete an active profile or if an enforcer mappings to it.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc delprofile <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.13 dpi opc enableprofile

Enables a profile in the DPI OPC profile table. A profile can only be activated when all required parameters are set. After activation modifications no longer possible.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc enableprofile <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.14 dpi opc disableprofile

Disables a profile in the DPI OPC profile table. You cannot inactivate a profile if an active enforcer mappings to it.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi opc disableprofile <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.15 dpi iec104 commit

Writes all changes made in the DPI IEC104 profiles to the enforcer.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi iec104 commit

### 14.1.16 dpi iec104 add

Adds a profile to the DPI IEC104 profile table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi iec104 add <P-1> [description <P-2>] [function-type <P-3>] [adv-type-id-list <P-4>] [transmission-size <P-5>] [originator-addr-list <P-6>] [common-addr-list <P-7>] [sanity-check <P-8>] [reset <P-9>] [debug <P-10>] [common-addr-size <P-11>] [io-addr-size <P-12>] [allow-101 <P-13>]

[description]: Description/name for the DPI IEC104 profile.
[function-type]: Function type.
[adv-type-id-list]: Advanced type ID list.
[transmission-size]: Set cause of transmission size.
[originator-addr-list]: Originator address list (Configurable when cause of transmission size is 2).
[common-addr-list]: Common address list (For common address size 1, range is 0-255 and for common address size 2, range is 0-65535).

[sanity-check]: Sanity check including format and specification.
[reset]: Reset connection message.
[debug]: Debug output in reset message.
[common-addr-size]: Set common address size.
[io-addr-size]: Set IO address size.
[allow-101]: Allow IEC101 type IDs.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |
| P-2 | string | Profile description/name |
| P-3 | readonly | Read only type IDs for type ID list. |
| | readwrite | Read write type IDs for type ID list. |
| | common | Common type IDs for type ID list. |
| | any | All possible type IDs for type ID list (allow any type ID). |
| | advanced | Lets the user specify customized type IDs for type ID list. |

| Parameter | Value | Meaning |
|---|---|---|
| P-4 | 1..255 | Comma separated type ID e.g 1,2,3. |
| | 1 | Single point information m-sp-na-1 |
| | 2 | Single point information with time tag m-sp-ta-1 |
| | 3 | Double point information m-dp-na-1 |
| | 4 | Double point information with time tag m-dp-ta-1 |
| | 5 | Step position information m-st-na-1 |
| | 6 | Step position information with time tag m-st-ta-1 |
| | 7 | Bit string of 32 bit m-bo-na-1 |
| | 8 | Bit string of 32 bit with time tag m-bo-ta-1 |
| | 9 | Measured value, normalized value m-me-na-1 |
| | 10 | Measured value, normalized value with time tag m-me-ta-1 |
| | 11 | Measured value, scaled value m-me-nb-1 |
| | 12 | Measured value, scaled value with time tag m-me-tb-1 |
| | 13 | Measured value, short floating point value m-me-nc-1 |
| | 14 | Measured value, short floating point value with time tag m-me-tc-1 |
| | 15 | Integrated totals m-it-na-1 |
| | 16 | Integrated totals with time tag m-it-ta-1 |
| | 17 | Event of protection equipment with time tag m-ep-ta-1 |
| | 18 | Packed start events of protection equipment with time tag m-ep-tb-1 |
| | 19 | Packed output circuit information of protection equipment with time tag m-ep-tc-1 |
| | 20 | Packed single-point information with status change detection m-ps-na-1 |
| | 21 | Measured value, normalized value without quality descriptor m-me-nd-1 |
| | 30 | Single point information with time tag cp56time2a m-sp-tb-1 |
| | 31 | Double point information with time tag cp56time2a m-dp-tb-1 |
| | 32 | Step position information with time tag cp56time2a m-st-tb-1 |
| | 33 | Bit string of 32 bit with time tag cp56time2a m-bo-tb-1 |
| | 34 | Measured value, normalized value with time tag cp56time2a m-me-td-1 |
| | 35 | Measured value, scaled value with time tag cp56time2a m-me-te-1 |
| | 36 | Measured value, short floating point value with time tag cp56time2a m-me-tf-1 |
| | 37 | Integrated totals with time tag cp56time2a m-it-tb-1 |
| | 38 | Event of protection equipment with time tag cp56time2a m-ep-td-1 |
| | 39 | Packed start events of protection equipment with time tag cp56time2a m-ep-te-1 |
| | 40 | Packed output circuit information of protection equipment with time tag cp56time2a m-ep-tf-1 |
| | 45 | Single command c-sc-na-1 |
| | 46 | Double command c-dc-na-1 |
| | 47 | Regulating step command c-rc-na-1 |
| | 48 | Setpoint command, normalized value c-se-na-1 |
| | 49 | Setpoint command, scaled value c-se-nb-1 |
| | 50 | Setpoint command, short floating point value c-se-nc-1 |
| | 51 | Bit string 32 bit c-bo-na-1 |
| | 58 | Single command with time tag cp56time2a c-sc-ta-1 |
| | 59 | Double command with time tag cp56time2a c-dc-ta-1 |
| | 60 | Regulating step command with time tag cp56time2a c-rc-ta-1 |
| | 61 | Setpoint command, normalized value with time tag cp56time2a c-se-ta-1 |
| | 62 | Setpoint command, scaled value with time tag cp56time2a c-se-tb-1 |
| | 63 | Setpoint command, short floating point value with time tag cp56time2a c-se-tc-1 |
| | 64 | Bit string 32 bit with time tag cp56time2a c-bo-ta-1 |
| | 70 | End of initialization m-ei-na-1 |
| | 100 | (General-) Interrogation command c-ic-na-1 |
| | 101 | Counter interrogation command c-ci-na-1 |
| | 102 | Read command c-rd-na-1 |
| | 103 | Clock synchronization command c-cs-na-1 |
| | 104 | ( IEC 101 ) Test command c-ts-nb-1 |
| | 105 | Reset process command c-rp-nc-1 |
| | 106 | ( IEC 101 ) Delay acquisition command c-cd-na-1 |
| | 107 | Test command with time tag cp56time2a c-ts-ta-1 |
| | 110 | Parameter of measured value, normalized value p-me-na-1 |
| | 111 | Parameter of measured value, scaled value p-me-nb-1 |
| | 112 | Parameter of measured value, short floating point value p-me-nc-1 |

| Parameter | Value | Meaning |
|---|---|---|
| | 113 | Parameter activation p-ac-na-1 |
| | 120 | File ready f-fr-na-1 |
| | 121 | Section ready f-sr-na-1 |
| | 122 | Call directory, select file, call file, call section f-sc-na-1 |
| | 123 | Last section, last segment f-ls-na-1 |
| | 124 | Ack file, Ack section f-af-na-1 |
| | 125 | Segment f-sg-na-1 |
| | 126 | f-dr-ta-1 |
| | 127 | QueryLog - Request archive file f-sc-nb-1 |
| | 128..135 | Reserved for routing of messages |
| | .. | Type ID from 136-255 and undefined type IDs are reserved for special use |
| P-5 | 1..2 | Specify the cause-of-transmission size. |
| P-6 | 0..255 | Set originator address. |
| | 0..255 | Set list of originator address with comma seperated e.g 1,5. |
| | 0..255 | Set range of originator address e.g 5-10. |
| | 0..255 | Set list and range of originator address e.g 1,5-10,120-255. |
| P-7 | 0..255/65535 | Set common address. |
| | 0..255/65535 | Set list of common address with comma seperated e.g 1,5. |
| | 0..255/65535 | Set range of common address e.g 5-10. |
| | 0..255/65535 | Set list and range of common address e.g 1,5-10,120-300. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |
| P-9 | enable | Enable the option. |
| | disable | Disable the option. |
| P-10 | enable | Enable the option. |
| | disable | Disable the option. |
| P-11 | 1..2 | Specify the common address size. |
| P-12 | 1..3 | Specify the IO address size. |
| P-13 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.17 dpi iec104 modify

Modifies a profile in the DPI IEC104 profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi iec104 modify <P-1> [description <P-2>] [function-type <P-3>] [adv-type-id-list <P-4>] [transmission-size <P-5>] [originator-addr-list <P-6>] [common-addr-list <P-7>] [sanity-check <P-8>] [reset <P-9>] [debug <P-10>] [common-addr-size <P-11>] [io-addr-size <P-12>] [allow-101 <P-13>]`

`[description]`: Description/name for the DPI IEC104 profile.
`[function-type]`: Function type.
`[adv-type-id-list]`: Advanced type ID list.
`[transmission-size]`: Set cause of transmission size.
`[originator-addr-list]`: Originator address list (Configurable when cause of transmission size is 2).
`[common-addr-list]`: Common address list (For common address size 1, range is 0-255 and for common address size 2, range is 0-65535).
`[sanity-check]`: Sanity check including format and specification.
`[reset]`: Reset connection message.
`[debug]`: Debug output in reset message.
`[common-addr-size]`: Set Common Address Size.
`[io-addr-size]`: Set IO address size.
`[allow-101]`: Allow IEC101 type IDs.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |
| P-2 | string | Profile description/name |
| P-3 | readonly | Read only type IDs for type ID list. |
| | readwrite | Read write type IDs for type ID list. |
| | common | Common type IDs for type ID list. |
| | any | All possible type IDs for type ID list (allow any type ID). |
| | advanced | Lets the user specify customized type IDs for type ID list. |

| Parameter | Value | Meaning |
|---|---|---|
| P-4 | 1..255 | Comma separated type ID e.g 1,2,3. |
| | 1 | Single point information m-sp-na-1 |
| | 2 | Single point information with time tag m-sp-ta-1 |
| | 3 | Double point information m-dp-na-1 |
| | 4 | Double point information with time tag m-dp-ta-1 |
| | 5 | Step position information m-st-na-1 |
| | 6 | Step position information with time tag m-st-ta-1 |
| | 7 | Bit string of 32 bit m-bo-na-1 |
| | 8 | Bit string of 32 bit with time tag m-bo-ta-1 |
| | 9 | Measured value, normalized value m-me-na-1 |
| | 10 | Measured value, normalized value with time tag m-me-ta-1 |
| | 11 | Measured value, scaled value m-me-nb-1 |
| | 12 | Measured value, scaled value with time tag m-me-tb-1 |
| | 13 | Measured value, short floating point value m-me-nc-1 |
| | 14 | Measured value, short floating point value with time tag m-me-tc-1 |
| | 15 | Integrated totals m-it-na-1 |
| | 16 | Integrated totals with time tag m-it-ta-1 |
| | 17 | Event of protection equipment with time tag m-ep-ta-1 |
| | 18 | Packed start events of protection equipment with time tag m-ep-tb-1 |
| | 19 | Packed output circuit information of protection equipment with time tag m-ep-tc-1 |
| | 20 | Packed single-point information with status change detection m-ps-na-1 |
| | 21 | Measured value, normalized value without quality descriptor m-me-nd-1 |
| | 30 | Single point information with time tag cp56time2a m-sp-tb-1 |
| | 31 | Double point information with time tag cp56time2a m-dp-tb-1 |
| | 32 | Step position information with time tag cp56time2a m-st-tb-1 |
| | 33 | Bit string of 32 bit with time tag cp56time2a m-bo-tb-1 |
| | 34 | Measured value, normalized value with time tag cp56time2a m-me-td-1 |
| | 35 | Measured value, scaled value with time tag cp56time2a m-me-te-1 |
| | 36 | Measured value, short floating point value with time tag cp56time2a m-me-tf-1 |
| | 37 | Integrated totals with time tag cp56time2a m-it-tb-1 |
| | 38 | Event of protection equipment with time tag cp56time2a m-ep-td-1 |
| | 39 | Packed start events of protection equipment with time tag cp56time2a m-ep-te-1 |
| | 40 | Packed output circuit information of protection equipment with time tag cp56time2a m-ep-tf-1 |
| | 45 | Single command c-sc-na-1 |
| | 46 | Double command c-dc-na-1 |
| | 47 | Regulating step command c-rc-na-1 |
| | 48 | Setpoint command, normalized value c-se-na-1 |
| | 49 | Setpoint command, scaled value c-se-nb-1 |
| | 50 | Setpoint command, short floating point value c-se-nc-1 |
| | 51 | Bit string 32 bit c-bo-na-1 |
| | 58 | Single command with time tag cp56time2a c-sc-ta-1 |
| | 59 | Double command with time tag cp56time2a c-dc-ta-1 |
| | 60 | Regulating step command with time tag cp56time2a c-rc-ta-1 |
| | 61 | Setpoint command, normalized value with time tag cp56time2a c-se-ta-1 |
| | 62 | Setpoint command, scaled value with time tag cp56time2a c-se-tb-1 |
| | 63 | Setpoint command, short floating point value with time tag cp56time2a c-se-tc-1 |
| | 64 | Bit string 32 bit with time tag cp56time2a c-bo-ta-1 |
| | 70 | End of initialization m-ei-na-1 |
| | 100 | (General-) Interrogation command c-ic-na-1 |
| | 101 | Counter interrogation command c-ci-na-1 |
| | 102 | Read command c-rd-na-1 |
| | 103 | Clock synchronization command c-cs-na-1 |
| | 104 | ( IEC 101 ) Test command c-ts-nb-1 |
| | 105 | Reset process command c-rp-nc-1 |
| | 106 | ( IEC 101 ) Delay acquisition command c-cd-na-1 |
| | 107 | Test command with time tag cp56time2a c-ts-ta-1 |
| | 110 | Parameter of measured value, normalized value p-me-na-1 |
| | 111 | Parameter of measured value, scaled value p-me-nb-1 |
| | 112 | Parameter of measured value, short floating point value p-me-nc-1 |
| | 113 | Parameter activation p-ac-na-1 |
| | 120 | File ready f-fr-na-1 |
| | 121 | Section ready f-sr-na-1 |
| | 122 | Call directory, select file, call file, call section f-sc-na-1 |

| Parameter | Value | Meaning |
|---|---|---|
| | 123 | Last section, last segment f-ls-na-1 |
| | 124 | Ack file, Ack section f-af-na-1 |
| | 125 | Segment f-sg-na-1 |
| | 126 | f-dr-ta-1 |
| | 127 | QueryLog - Request archive file f-sc-nb-1 |
| | 128..135 | Reserved for routing of messages |
| | .. | Type ID from 136-255 and undefined type IDs are reserved for special use |
| P-5 | 1..2 | Specify the cause-of-transmission size. |
| P-6 | 0..255 | Set originator address. |
| | 0..255 | Set list of originator address with comma seperated e.g 1,5. |
| | 0..255 | Set range of originator address e.g 5-10. |
| | 0..255 | Set list and range of originator address e.g 1,5-10,120-255. |
| P-7 | 0..255/65535 | Set common address. |
| | 0..255/65535 | Set list of common address with comma seperated e.g 1,5. |
| | 0..255/65535 | Set range of common address e.g 5-10. |
| | 0..255/65535 | Set list and range of common address e.g 1,5-10,120-300. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |
| P-9 | enable | Enable the option. |
| | disable | Disable the option. |
| P-10 | enable | Enable the option. |
| | disable | Disable the option. |
| P-11 | 1..2 | Specify the common address size. |
| P-12 | 1..3 | Specify the IO address size. |
| P-13 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.18 dpi iec104 delete

Deletes a profile from the DPI IEC104 profile table. You cannot delete an active profile or if an enforcer maps to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi iec104 delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.19 dpi iec104 enable

Enables a profile in the DPI IEC104 profile table. A profile can only be activated when all required parameters are set. After activation no modifications are possible.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi iec104 enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.20 dpi iec104 disable

Disables a profile in the DPI IEC104 profile table. You cannot deactivate a profile if an active enforcer maps to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi iec104 disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index 1 - 32 |

### 14.1.21 dpi iec104 copy

Copies a profile to another DPI IEC104 profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi iec104 copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile source index 1 - 32 |
| P-2 | 1..32 | Profile destination index 1 - 32 |

### 14.1.22 dpi dnp3 profile add

Adds a profile to the DPI DNP3 profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile add <P-1> [description <P-2>] [function-code-list <P-3>] [default-object-list <P-4>] [sanity-check <P-5>] [crc-check <P-6>] [outstation-packets-check <P-7>] [reset-tcp-check <P-8>]`

`[description]`: Profile description/name for the DPI DNP3 profile.
`[function-code-list]`: Function code list. A function code has the syntax 'val'. Function codes are separated by a comma.
`[default-object-list]`: Object entries to be included from Default white list.
`[sanity-check]`: Sanity check including format and specification.
`[crc-check]`: CRC verification for DNP3 data link layer frames.
`[outstation-packets-check]`: Check the DNP3 data packets originating at an outstation.
`[reset-tcp-check]`: Reset the TCP connection in case of a protocol violation or if the plausibility check leads to errors.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | DNP3 profile index. |
| P-2 | string | Profile description/name for the DNP3 profile. |
| P-3 | 0..255 | Function codes for the DNP3 profile. |
| | 0 | Confirm |
| | 1 | Read |
| | 2 | Write |
| | 3 | Select |
| | 4 | Operate |
| | 5 | Direct Operate |
| | 6 | Direct Operate-No Response Required |
| | 7 | Freeze |
| | 8 | Freeze-No Response Required |
| | 9 | Freeze Clear |
| | 10 | Freeze Clear-No Response Required |
| | 11 | Freeze At Time |
| | 12 | Freeze At Time-No Response Required |
| | 13 | Cold Restart |
| | 14 | Warm Restart |
| | 15 | Initialize Data |
| | 16 | Initialize Application |
| | 17 | Start Application |
| | 18 | Stop Application |
| | 19 | Save Configuration |
| | 20 | Enable Unsolicited Messages |
| | 21 | Disable Unsolicited Messages |
| | 22 | Assign Class |
| | 23 | Delay Measurement |
| | 24 | Record Current Time |
| | 25 | Open File |
| | 26 | Close File |
| | 27 | Delete File |
| | 28 | Get File Information |
| | 29 | Authenticate File |
| | 30 | Abort File Transfer |
| | 31 | Activate Configuration |
| | 32 | Authenticate Request |
| | 33 | Authenticate Request-No Acknowledgement |
| | 129 | Response |
| | 130 | Unsolicited Response |
| | 131 | Authentication Response |
| P-4 | 1..317 | Comma separated index values e.g 1,2,3. |
| | 1..317 | Comma separated index and range of index values e.g 1-10,120-300. |
| | none | 'none' to exclude all default object list entries. |
| | all | 'all' to include all default object list entries. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.23 dpi dnp3 profile modify

Modifies a profile to the DPI DNP3 profile table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi dnp3 profile modify <P-1> [description <P-2>] [function-code-list <P-3>] [default-object-list <P-4>] [sanity-check <P-5>] [crc-check <P-6>] [outstation-packets-check <P-7>] [reset-tcp-check <P-8>]

[description]: Profile description/name for the DPI DNP3 profile.
[function-code-list]: Function code list. A function code has the syntax 'val'. Function codes are separated by a comma.
[default-object-list]: Object entries to be included from Default white list.
[sanity-check]: Sanity check including format and specification.
[crc-check]: CRC verification for DNP3 data link layer frames.
[outstation-packets-check]: Check the DNP3 data packets originating at an outstation.
[reset-tcp-check]: Reset the TCP connection in case of a protocol violation or if the plausibility check leads to errors.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | DNP3 profile index. |
| P-2 | string | Profile description/name for the DNP3 profile. |

| Parameter | Value | Meaning |
|---|---|---|
| P-3 | 0..255 | Function codes for the DNP3 profile. |
| | 0 | Confirm |
| | 1 | Read |
| | 2 | Write |
| | 3 | Select |
| | 4 | Operate |
| | 5 | Direct Operate |
| | 6 | Direct Operate-No Response Required |
| | 7 | Freeze |
| | 8 | Freeze-No Response Required |
| | 9 | Freeze Clear |
| | 10 | Freeze Clear-No Response Required |
| | 11 | Freeze At Time |
| | 12 | Freeze At Time-No Response Required |
| | 13 | Cold Restart |
| | 14 | Warm Restart |
| | 15 | Initialize Data |
| | 16 | Initialize Application |
| | 17 | Start Application |
| | 18 | Stop Application |
| | 19 | Save Configuration |
| | 20 | Enable Unsolicited Messages |
| | 21 | Disable Unsolicited Messages |
| | 22 | Assign Class |
| | 23 | Delay Measurement |
| | 24 | Record Current Time |
| | 25 | Open File |
| | 26 | Close File |
| | 27 | Delete File |
| | 28 | Get File Information |
| | 29 | Authenticate File |
| | 30 | Abort File Transfer |
| | 31 | Activate Configuration |
| | 32 | Authenticate Request |
| | 33 | Authenticate Request-No Acknowledgement |
| | 129 | Response |
| | 130 | Unsolicited Response |
| | 131 | Authentication Response |
| P-4 | 1..317 | Comma separated index values e.g 1,2,3. |
| | 1..317 | Comma separated index and range of index values e.g 1-10,120-300. |
| | none | 'none' to exclude all default object list entries. |
| | all | 'all' to include all default object list entries. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.24 dpi dnp3 profile delete

Deletes a profile from the DPI DNP3 profile table. You cannot delete an active profile or if an enforcer mappings to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | DNP3 profile index. |

### 14.1.25 dpi dnp3 profile enable

Enables a profile in the DPI DNP3 profile table. A profile can only be activated when all required parameters are set. After activation modifications no longer possible.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `DNP3 profile index.` |

### 14.1.26 dpi dnp3 profile disable

Disables a profile in the DPI DNP3 profile table. You cannot inactivate a profile if an active enforcer mappings to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `DNP3 profile index.` |

### 14.1.27 dpi dnp3 profile commit

Writes all changes made in the DPI DNP3 profiles to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile commit`

### 14.1.28 dpi dnp3 profile copy

Copies a profile to another DPI DNP3 profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 profile copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Source index of DPI DNP3 profile.` |
| `P-2` | 1..32 | `Destination index of DPI DNP3 profile.` |

### 14.1.29 dpi dnp3 object add

Adds an object to a DPI DNP3 rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 object <P-1> add <P-2> object-type <P-3> group-number <P-4> variation-number <P-5> function-code <P-6> [function-name <P-7>] [function-length <P-8>] [qualifier-code-list <P-9>]`

`object-type`: Object type for DPI DNP3 object.
`group-number`: Group number for DNP3 object ranging 0-255.
`variation-number`: Variation number could either be any integer between 0-255 or a range from 0-255.
`function-code`: Function code for DNP3 object.
`[function-name]`: Function name for DNP3 object.
`[function-length]`: Function length for DNP3 Object.
`[qualifier-code-list]`: Qualifier code list, hexadecimal numbers separated by a comma(e.g numbers ranging between 0x00 to 0xFF).

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `DNP3 profile index.` |
| `P-2` | 1..256 | `DNP3 Object index.` |
| `P-3` | request | `Request` |
| | response | `Response` |
| `P-4` | 0..255 | `Group number for DNP3 object.` |
| `P-5` | string | `Variation Number for DNP3 object.` |
| `P-6` | 0..255 | `Function code for DNP3 object.` |
| `P-7` | string | `Function Name for DNP3 object.` |
| `P-8` | string | `Function Length for DNP3 object.` |
| `P-9` | string | `Qualifier code list, hexadecimal numbers separated by a comma(e.g numbers ranging between 0x00 to 0xFF).` |

### 14.1.30 dpi dnp3 object delete

Deletes an object from a DPI DNP3 rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi dnp3 object <P-1> delete <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | DNP3 profile index. |
| P-2 | 1..256 | DNP3 Object index. |

### 14.1.31 dpi amp profile add

Adds a profile to the DPI AMP profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile add <P-1> [description <P-2>] [protocol <P-3>] [message-type <P-4>] [address-class <P-5>] [device-class <P-6>] [memory-address <P-7>] [data-word <P-8>] [task-code <P-9>] [task-code-data <P-10>] [error-check-characters <P-11>] [block-check-characters <P-12>] [debug <P-13>] [tcp-reset <P-14>] [sanity-check <P-15>]`

`[description]`: Specify the description/name for the DPI AMP profile. The description consists of an alphanumeric ASCII character string with 0..32 characters
`[protocol]`: Specify the protocol type for the DPI AMP profile.
`[message-type]`: Specify the value for the message type which specifies the type of data in the message data area and also specifies if the message is a command or a response. The allowed message types are 02,03,04,05,06,07,08,09,FF,any.
`[address-class]`: Specify the particular type of the memory to be accessed, (total number of hexadecimal values can be specified upto 205).
`[device-class]`: Specify the value for the device class, (total number of hexadecimal values can be specified upto 205).
`[memory-address]`: Specify the beginning address of the memory to be read or written, (total number of hexadecimal values can be specified upto 205).
`[data-word]`: Specify the value for the data words to be read from the remote device, (total number of hexadecimal values can be specified upto 205).
`[task-code]`: Specify the value for the task code.
`[task-code-data]`: Specify the hexadecimal value 0..F in the field task code data. The maximimum task code data length is up to 72 bytes
`[error-check-characters]`: Enable/disable the checking for the NITP error check characters (ECC) of the packets.
`[block-check-characters]`: Enable/disable the checking for the CAMP block check characters (BCC) of the AMP packets.
`[debug]`: Enable/disable the debugging in the DPI AMP profile, (if it is enabled then the reset connection message will contain the debug information).
`[tcp-reset]`: Enable/disable the resetting of the TCP connection, (if it is enabled then the TCP reset connection message will be sent in case a packet is dropped).
`[sanity-check]`: Enable/disable the sanity check including format and specification of all the AMP packets.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | camp | CAMP protocol |
| | nitp | NITP protocol |
| | any | The device applies the rule to every data packet without evaluating the protocol. |
| P-4 | any | The device applies the rule to every data packet without evaluating the message type. |
| | 02-09,FF | Enter message type with hexadecimal values separated by a comma, for example, 02,03,FF. |
| P-5 | any | The device applies the rule to every data packet without evaluating the address class. |
| | 0000-FFFF | Enter address class range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter address class with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of address class and address class range, for example, 0001,0003,0004-000A |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | any | The device applies the rule to every data packet without evaluating the device class. |
| | 0000-FFFF | Enter device class range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter device class with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of device class and device class range, for example, 0001,0003,0004-000A. |
| P-7 | any | The device applies the rule to every data packet without evaluating the memory address. |
| | 0000-FFFF | Enter memory address range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter memory address with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of memory address and memory address range, for example, 0001,0003,0004-000A. |
| P-8 | any | The device applies the rule to every data packet without evaluating the data word. |
| | 0000-FFFF | Enter data word range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter data word with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of data word and data word range, for example, 0001,0003,0004-000A. |
| P-9 | any | The device applies all the available task codes. |
| | 00-FF | Enter task code with hexadecimal values separated by a comma, for example, 01,03,FF. |
| P-10 | <data> | Enter the task code data in hexadecimal value 0..F, the task code data length is upto 72 bytes. |
| P-11 | enable | Enable the option. |
| | disable | Disable the option. |
| P-12 | enable | Enable the option. |
| | disable | Disable the option. |
| P-13 | enable | Enable the option. |
| | disable | Disable the option. |
| P-14 | enable | Enable the option. |
| | disable | Disable the option. |
| P-15 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.32 dpi amp profile copy

Copies a profile to another DPI AMP profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile source index |
| P-2 | 1..32 | Profile destination index |

### 14.1.33 dpi amp profile delete

Deletes a profile from the DPI AMP profile table. You cannot delete an active profile or if an enforcer mapped to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.34 dpi amp profile disable

Disables a profile in the DPI AMP profile table. You cannot deactivate a profile if an active enforcer mapped to it.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.35 dpi amp profile enable

Enables a profile in the DPI AMP profile table. A profile can only be activated when all required parameters are set. After activation no modifications are possible.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.36 dpi amp profile modify

Modifies a profile in the DPI AMP profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp profile modify <P-1> [description <P-2>] [protocol <P-3>] [message-type <P-4>] [address-class <P-5>] [device-class <P-6>] [memory-address <P-7>] [data-word <P-8>] [task-code <P-9>] [task-code-data <P-10>] [error-check-characters <P-11>] [block-check-characters <P-12>] [debug <P-13>] [tcp-reset <P-14>] [sanity-check <P-15>]`

`[description]`: Specify the description/name for the DPI AMP profile. The description consists of an alphanumeric ASCII character string with 0..32 characters.
`[protocol]`: Specify the protocol type for the DPI AMP profile.
`[message-type]`: Specify the value for the message type which specifies the type of data in the message data area and also specifies if the message is a command or a response. The allowed message types are 02,03,04,05,06,07,08,09,FF,any.
`[address-class]`: Specify the particular type of the memory to be accessed, (total number of hexadecimal values can be specified upto 205).
`[device-class]`: Specify the value for the device class, (total number of hexadecimal values can be specified upto 205).
`[memory-address]`: Specify the beginning address of the memory to be read or written, (total number of hexadecimal values can be specified upto 205).
`[data-word]`: Specify the value for the data words to be read from the remote device, (total number of hexadecimal values can be specified upto 205).
`[task-code]`: Specify the value for the task code.
`[task-code-data]`: Specify the hexadecimal value 0..F in the field task code data. The maximimum task code data length is up to 72 bytes.
`[error-check-characters]`: Enable/disable the checking for the NITP error check characters (ECC) of the packets.
`[block-check-characters]`: Enable/disable the checking for the CAMP block check characters (BCC) of the AMP packets.
`[debug]`: Enable/disable the debugging in the DPI AMP profile, (if it is enabled then the reset connection message will contain the debug information).
`[tcp-reset]`: Enable/disable the resetting of the TCP connection, (if it is enabled then the TCP reset connection message will be sent in case a packet is dropped).
`[sanity-check]`: Enable/disable the sanity check including format and specification of all the AMP packets.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | camp | CAMP protocol |
| | nitp | NITP protocol |
| | any | The device applies the rule to every data packet without evaluating the protocol. |
| P-4 | any | The device applies the rule to every data packet without evaluating the message type. |
| | 02-09,FF | Enter message type with hexadecimal values separated by a comma, for example, 02,03,FF. |
| P-5 | any | The device applies the rule to every data packet without evaluating the address class. |
| | 0000-FFFF | Enter address class range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter address class with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of address class and address class range, for example, 0001,0003,0004-000A |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | any | The device applies the rule to every data packet without evaluating the device class. |
| | 0000-FFFF | Enter device class range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter device class with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of device class and device class range, for example, 0001,0003,0004-000A. |
| P-7 | any | The device applies the rule to every data packet without evaluating the memory address. |
| | 0000-FFFF | Enter memory address range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter memory address with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of memory address and memory address range, for example, 0001,0003,0004-000A. |
| P-8 | any | The device applies the rule to every data packet without evaluating the data word. |
| | 0000-FFFF | Enter data word range with hexadecimal values connected by a hyphen, for example, 0004-000A. |
| | 0000-FFFF | Enter data word with hexadecimal values separated by a comma, for example, 0001,0003,FFFF. |
| | 0000-FFFF | Enter combination of data word and data word range, for example, 0001,0003,0004-000A. |
| P-9 | any | The device applies all the available task codes. |
| | 00-FF | Enter task code with hexadecimal values separated by a comma, for example, 01,03,FF. |
| P-10 | <data> | Enter the task code data in hexadecimal value 0..F, the task code data length is upto 72 bytes. |
| P-11 | enable | Enable the option. |
| | disable | Disable the option. |
| P-12 | enable | Enable the option. |
| | disable | Disable the option. |
| P-13 | enable | Enable the option. |
| | disable | Disable the option. |
| P-14 | enable | Enable the option. |
| | disable | Disable the option. |
| P-15 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.37 dpi amp commit

Writes all changes made in the DPI AMP profiles to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp commit`

### 14.1.38 dpi amp task-code add

Add a value for the task code.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp task-code add <P-1> [description <P-2>] [mode <P-3>]`

`[description]`: Specify the description for the task code. The description consists of an alphanumeric ASCII character string with 0..32 characters.
`[mode]`: Specify the value for the task code mode (i.e. config or non-config).

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 00-FF | Enter task code with hexadecimal value. The range is from 00 to FF. |
| P-2 | string | Enter the description for the task code. |
| P-3 | config | Specify the value config for the task code. |
| | non-config | Specify the value non-config for the task code. |

### 14.1.39 dpi amp task-code delete

Delete a value for the task code.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp task-code delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 00-FF | Enter task code with hexadecimal value. The range is from 00 to FF. |

### 14.1.40 dpi amp task-code modify

Modify a value for the task code.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp task-code modify <P-1> [description <P-2>] [mode <P-3>]`

`[description]`: Specify the description for the task code. The description consists of an alphanumeric ASCII character string with 0..32 characters.
`[mode]`: Specify the value for the task code mode (i.e. config or non-config).

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 00-FF | Enter task code with hexadecimal value. The range is from 00 to FF. |
| P-2 | string | Enter the description for the task code. |
| P-3 | config | Specify the value config for the task code. |
| | non-config | Specify the value non-config for the task code. |

### 14.1.41 dpi amp protect-mode

Enable/disable the program and mode protect.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi amp protect-mode <P-1>`

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

### 14.1.42 dpi enip profile add

Adds a profile to the DPI ENIP profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile add <P-1> [description <P-2>] [function-type <P-3>] [default-list <P-4>] [wildcard-list <P-5>] [sanity-check <P-6>] [debug <P-7>] [allow-emb-pccc <P-8>] [reset-tcp-check <P-9>]`

`[description]`: Profile description/name for the DPI ENIP profile.
`[function-type]`: Function type for the DPI ENIP profile.
`[default-list]`: Object entries to be included from Default object list.
`[wildcard-list]`: Wildcard service codes included for all class objects.
`[sanity-check]`: Sanity check including format and specification.
`[debug]`: Debug output in reset message.
`[allow-emb-pccc]`: Allow embedded PCCC option enables the filtering of PCCC protocol traffic embedded in CIP messages through firewall.
`[reset-tcp-check]`: Reset the TCP connection in case of a protocol violation or if the plausibility check discovers any error.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | readonly | CIP services that are data read commands are permitted. |
| | readwrite | CIP services that are data read or data write commands are permitted |
| | any | All CIP services are permitted. |
| | advanced | Lets the user add as many custom CIP objects as needed to one firewall rule. |
| P-4 | 1..347 | Comma separated index values e.g. 1,2,3. |
| | 1..347 | Comma separated index and range of index values e.g. 1-10,120-300. |
| | none | 'none' to exclude all default object list entries. |
| | all | 'all' to include all default object list entries. |
| P-5 | string | Service code list, hexadecimal numbers separated by a comma (e.g. numbers ranging between 0x00 to 0x7F). |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |
| P-9 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.43 dpi enip profile modify

Modifies a profile in the DPI ENIP profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile modify <P-1> [description <P-2>] [function-type <P-3>] [default-list <P-4>] [wildcard-list <P-5>] [sanity-check <P-6>] [debug <P-7>] [allow-emb-pccc <P-8>] [reset-tcp-check <P-9>]`

`[description]`: Profile description/name for the DPI ENIP profile.
`[function-type]`: Function type for the DPI ENIP profile.
`[default-list]`: Object entries to be included from Default object list.
`[wildcard-list]`: Wildcard service codes included for all class objects.
`[sanity-check]`: Sanity check including format and specification.
`[debug]`: Debug output in reset message.
`[allow-emb-pccc]`: Allow embedded PCCC enables the filtering of PCCC protocol traffic embedded in CIP messages through firewall.
`[reset-tcp-check]`: Reset the TCP connection in case of a protocol violation or if the plausibility check discovers any error.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | readonly | CIP services that are data read commands are permitted. |
| | readwrite | CIP services that are data read or data write commands are permitted |
| | any | All CIP services are permitted. |
| | advanced | Lets the user add as many custom CIP objects as needed to one firewall rule. |
| P-4 | 1..347 | Comma separated index values e.g. 1,2,3. |
| | 1..347 | Comma separated index and range of index values e.g. 1-10,120-300. |
| | none | 'none' to exclude all default object list entries. |
| | all | 'all' to include all default object list entries. |
| P-5 | string | Service code list, hexadecimal numbers separated by a comma (e.g. numbers ranging between 0x00 to 0x7F). |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |
| P-9 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.44 dpi enip profile delete

Deletes a profile from the DPI ENIP profile table. You cannot delete an active profile or if any mapping is added to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.45 dpi enip profile enable

Enables a profile in the DPI ENIP profile table. A profile can only be activated when all required parameters are set. After activation modifications are no longer possible.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index` |

### 14.1.46 dpi enip profile disable

Disables a profile in the DPI ENIP profile table. You cannot disable a profile if an active enforcer mapping to it exists.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index` |

### 14.1.47 dpi enip profile commit

Writes all changes made in the DPI ENIP profiles to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile commit`

### 14.1.48 dpi enip profile copy

Copies a profile to new DPI ENIP profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip profile copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile source index` |
| `P-2` | 1..32 | `Profile destination index` |

### 14.1.49 dpi enip object add

DPI ENIP Object settings. Adds an object to a DPI ENIP rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip object add <P-1> <P-2> <P-3> [description <P-4>]`

`[description]`: Description of the CIP object.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index.` |
| `P-2` | 0x0..0xFFFFFFFF | `Class ID is a hexadecimal number (e.g. number ranging between 0x00 to 0xFFFFFFFF).` |
| `P-3` | string | `Service code list, hexadecimal numbers separated by a comma (e.g. numbers ranging between 0x00 to 0x7F).` |
| `P-4` | string | `Object description/name for the CIP Object.` |

### 14.1.50 dpi enip object modify

Modifies an object in a DPI ENIP object.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip object modify <P-1> <P-2> <P-3> [description <P-4>]`

`[description]`: Description/name of the CIP object.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index.` |
| `P-2` | 0x0..0xFFFFFFFF | `Class ID is a hexadecimal number (e.g. number ranging between 0x00 to 0xFFFFFFFF).` |
| `P-3` | string | `Service code list, hexadecimal numbers separated by a comma (e.g. numbers ranging between 0x00 to 0x7F).` |
| `P-4` | string | `Object description/name for the CIP Object.` |

### 14.1.51 dpi enip object delete

Deletes an object from a DPI ENIP rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi enip object delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index. |
| P-2 | 0x0..0xFFFFFFFF | Class ID is a hexadecimal number (e.g. number ranging between 0x00 to 0xFFFFFFFF). |

### 14.1.52 dpi goose add

Adds a profile to the DPI GOOSE profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose add <P-1> [description <P-2>] [sanity-check <P-3>] [stsq-check <P-4>]`

`[description]`: Profile description/name for the DPI GOOSE profile.
`[sanity-check]`: Sanity check including format and specification.
`[stsq-check]`: Status and Sequence check.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | enable | Enable the option. |
| | disable | Disable the option. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.53 dpi goose modify

Modifies a profile in the DPI GOOSE profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose modify <P-1> [description <P-2>] [sanity-check <P-3>] [stsq-check <P-4>]`

`[description]`: Profile description/name for the DPI GOOSE profile.
`[sanity-check]`: Sanity check including format and specification.
`[stsq-check]`: Status and Sequence check.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |
| P-2 | string | Profile description/name |
| P-3 | enable | Enable the option. |
| | disable | Disable the option. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.54 dpi goose delete

Deletes a profile from the DPI GOOSE profile table. You cannot delete an active profile or if any mapping is added to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.55 dpi goose enable

Enables a profile in the DPI GOOSE profile table. A profile can only be activated when all required parameters are set. After activation modifications are no longer possible.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile index |

### 14.1.56 dpi goose disable

Disables a profile in the DPI GOOSE profile table. You cannot disable a profile if an active enforcer mapping to it exists.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index` |

### 14.1.57 dpi goose commit

Writes all changes made in the DPI GOOSE profiles to the enforcer.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose commit`

### 14.1.58 dpi goose copy

Copies a profile to new DPI GOOSE profile.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi goose copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile source index` |
| `P-2` | 1..32 | `Profile destination index` |

### 14.1.59 dpi s7 rule add

Adds a rule to the DPI S7 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 rule add <P-1> <P-2> function-type <P-3> function-group <P-4> sub-function-group <P-5>`

`function-type`: Function type of the S7 rule
`function-group`: Specify a function group.
`sub-function-group`: Specify one or more hexadecimal numbers (0x00..0xFF) separated by commas within the range 0x00 to 0xff (e.g., 0x01 or 0x00, 0x01, 0x02) or [-]. If you specify [-], the device does not perform the DPI on the data packets based on the sub-function group.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..40 | `S7 template index` |
| `P-2` | 1..25 | `S7 rule index` |
| `P-3` | 0x00..0xFF (For S7comm) | `Function type is a hexadecimal number` |
| | 0x04B1..0xFFFF (For S7comm Plus) | `Function type is a hexadecimal number` |
| `P-4` | string | `Function group is a hexadecimal number (e.g. number ranging between 0x00 to 0xFF)` |
| `P-5` | string | `Sub-function group, hexadecimal numbers separated by a comma (e.g. number ranging between 0x00 to 0xFF)` |

### 14.1.60 dpi s7 rule modify

Modify a rule in the DPI S7 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 rule modify <P-1> <P-2> function-type <P-3> function-group <P-4> sub-function-group <P-5>`

`function-type`: Function type of the S7 rule
`function-group`: Specify a function group.
`sub-function-group`: Sub-Function Group list, hexadecimal numbers separated by a comma(e.g numbers ranging between 0x00 to 0xFF).

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..40 | `S7 template index` |
| `P-2` | 1..25 | `S7 rule index` |

| Parameter | Value | Meaning |
|---|---|---|
| P-3 | 0x00..0xFF (For S7comm) | Function type is a hexadecimal number |
| | 0x04B1..0xFFFF (For S7comm Plus) | Function type is a hexadecimal number |
| P-4 | string | Function group is a hexadecimal number (e.g. number ranging between 0x00 to 0xFF) |
| P-5 | string | Sub-function group, hexadecimal numbers separated by a comma (e.g. number ranging between 0x00 to 0xFF) |

### 14.1.61 dpi s7 rule delete

Delete a rule from the DPI S7 rule table based on its template index.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 rule delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |
| P-2 | 1..25 | S7 rule index |

### 14.1.62 dpi s7 rule enable

Enable a rule in the DPI S7 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 rule enable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |
| P-2 | 1..25 | S7 rule index |

### 14.1.63 dpi s7 rule disable

Disables a rule in the DPI S7 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 rule disable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |
| P-2 | 1..25 | S7 rule index |

### 14.1.64 dpi s7 template add

Adds a template to the DPI S7 template table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 template add <P-1> description <P-2> protocol-type <P-3>`

`description`: Specify a description or name for the DPI S7 template.
`protocol-type`: S7 protocol selection for the template

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |
| P-2 | string | Specify a description or name for the DPI S7 profile. |
| P-3 | s7comm | Select this to perform DPI on S7comm protocol data packets. |
| | s7commplus | Select this to perform DPI on S7comm Plus protocol data packets. |

### 14.1.65 dpi s7 template modify

Modify a template in the DPI S7 template table..

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 template modify <P-1> description <P-2>`

`description`: Specify a description or name for the DPI S7 template.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |
| P-2 | string | Specify a description or name for the DPI S7 profile. |

### 14.1.66 dpi s7 template delete

Deletes a template from the DPI S7 template table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 template delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | S7 template index |

### 14.1.67 dpi s7 template copy

Copies an existing template to the DPI S7 template table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 template copy <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..40 | Template source index |
| P-2 | 1..40 | Template destination index |

### 14.1.68 dpi s7 profile add

Adds a profile to the DPI S7 profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 profile add <P-1> [description <P-2>] [template-list <P-3>] [sanity-check <P-4>] [debug <P-5>] [tcp-reset <P-6>]`

`[description]`: Specify a description or name for the DPI S7 profile.
`[template-list]`: Template List. Specify the decimal numbers separated by commas within the range 1 to 40 (e.g., 1,2,3).
`[sanity-check]`: Sanity check including format and specification.
`[debug]`: Debug check.
`[tcp-reset]`: TCP reset including format and specification.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | S7 profile index |
| P-2 | string | Specify a description or name for the DPI S7 profile. |
| P-3 | 1..40 | S7 template list |
| 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. |

### 14.1.69 dpi s7 profile modify

Modifies a profile in the DPI S7 profile table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `dpi s7 profile modify <P-1> [description <P-2>] [template-list <P-3>] [sanity-check <P-4>] [debug <P-5>] [tcp-reset <P-6>]`

`[description]`: Specify a description or name for the DPI S7 profile.
`[template-list]`: Template List. Specify the decimal numbers separated by commas within the rage 1 to 40 (e.g., 1,2,3).
`[sanity-check]`: Sanity check including format and specification.
`[debug]`: Debug check.
`[tcp-reset]`: TCP reset including format and specification.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | S7 profile index |
| P-2 | string | Profile description/name |
| P-3 | 1..40 | S7 template list |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |

### 14.1.70 dpi s7 profile delete

Deletes a profile from the DPI S7 profile table. You cannot delete an active profile or a profile with any mapping added to the enforcer.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi s7 profile delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | S7 profile index |

### 14.1.71 dpi s7 profile enable

Enable a profile in the DPI S7 profile table. A profile can only be activated when all required parameters are set. The device restricts modifications to an active profile.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi s7 profile enable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | S7 profile index |

### 14.1.72 dpi s7 profile disable

Disables a profile in the DPI S7 profile table. You cannot inactivate a profile with any mapping added to the enforcer.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi s7 profile disable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | S7 profile index |

### 14.1.73 dpi s7 profile commit

Writes all changes made in the DPI S7 profiles to the enforcer.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi s7 profile commit

### 14.1.74 dpi s7 profile copy

Copies an existing profile to the DPI S7 profile table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: dpi s7 profile copy <P-1> <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..32 | Profile source index |
| P-2 | 1..32 | Profile destination index |

## 14.2 show

Display device options and settings.

### 14.2.1 show dpi modbus profiletable

Display the DPI MODBUS profile table.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show dpi modbus profiletable

### 14.2.2 show dpi modbus pending

Display whether uncommitted changes for DPI MODBUS enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi modbus pending`

### 14.2.3 show dpi opc profiletable

Display the DPI OPC profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi opc profiletable`

### 14.2.4 show dpi opc pending

Display whether uncommitted changes for DPI OPC enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi opc pending`

### 14.2.5 show dpi iec104 profiletable

Display the DPI IEC104 profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi iec104 profiletable`

### 14.2.6 show dpi iec104 pending

Display whether uncommitted changes for DPI IEC104 enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi iec104 pending`

### 14.2.7 show dpi dnp3 profiletable

Display the DPI DNP3 profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi dnp3 profiletable`

### 14.2.8 show dpi dnp3 pending

Display whether uncommitted changes for DPI DNP3 enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi dnp3 pending`

### 14.2.9 show dpi dnp3 objectlist

Display the DPI DNP3 object list for a profile.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi dnp3 objectlist <P-1> [<P-2>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `DNP3 profile index.` |
| `P-2` | 1..256 | `DNP3 Object index.` |

### 14.2.10 show dpi amp global

Display the AMP global information and settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi amp global`

### 14.2.11 show dpi amp profiletable

Display the DPI AMP profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi amp profiletable`

### 14.2.12 show dpi amp taskcodetable

Display the DPI AMP task code table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi amp taskcodetable`

### 14.2.13 show dpi enip profiletable

Display the DPI ENIP profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi enip profiletable`

### 14.2.14 show dpi enip pending

Display whether uncommitted changes for DPI ENIP enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi enip pending`

### 14.2.15 show dpi enip objectlist

Display the DPI ENIP object list for a profile.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi enip objectlist <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..32 | `Profile index` |

### 14.2.16 show dpi goose profiletable

Display the DPI GOOSE profile table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi goose profiletable`

### 14.2.17 show dpi goose pending

Display whether uncommitted changes for DPI GOOSE enforcer exist.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi goose pending`

### 14.2.18 show dpi s7 templatetable

Display the DPI S7 template table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi s7 templatetable`

### 14.2.19 show dpi s7 ruletable

Display the DPI S7 rule table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi s7 ruletable`

### 14.2.20 show dpi s7 pending

Display if uncommitted changes for the DPI S7 exist.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi s7 pending`

### 14.2.21 show dpi s7 profiletable

Display the DPI S7 profile table.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show dpi s7 profiletable`

# 15 Filtering Database (FDB)

## 15.1 mac-filter

### 15.1.1 mac-filter

Static MAC filter configuration.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `mac-filter <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | aa:bb:cc:dd:ee:ff | `MAC address.` |
| `P-2` | 1..4042 | `Enter the VLAN ID.` |

- **no mac-filter**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no mac-filter <P-1> <P-2>`

## 15.2 bridge

Bridge configuration.

### 15.2.1 bridge aging-time

Aging time configuration.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `bridge aging-time <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 10..500000 | `Enter a number in the given range.` |

## 15.3 show

Display device options and settings.

### 15.3.1 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`

## 15.4 show

Display device options and settings.

### 15.4.1 show bridge aging-time

Address aging time.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show bridge aging-time`

## 15.5 show

Display device options and settings.

### 15.5.1 show mac-addr-table

Display the MAC address table.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show mac-addr-table [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f | `Enter a MAC address.` |
| | 1..4042 | `Enter a VLAN ID.` |

## 15.6 clear

Clear several items.

### 15.6.1 clear mac-addr-table

Clears the MAC address table.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `clear mac-addr-table`

# 16 Firewall Learning Mode (FLM)

## 16.1 flm

Configure the firewall learning mode.

### 16.1.1 flm operation

Enable/disable the firewall learning mode.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `flm operation <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | enable | Enable the firewall learning mode. |
| | disable | Disable the firewall learning mode. |

**no flm operation**
Disable the option
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no flm operation <P-1>`

### 16.1.2 flm action

Set the action for the firewall learning mode.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `flm action <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | start | Start a learning phase. |
| | stop | Stop a learning phase. |
| | continue | Continue the previous learning phase. |
| | clear | Clear the learned data. |

### 16.1.3 flm interface add

Add an interface to the firewall learning mode.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `flm interface add <P-1>`

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

### 16.1.4 flm interface delete

Delete an interface from the firewall learning mode.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `flm interface delete <P-1>`

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

## 16.2 show

Display device options and settings.

### 16.2.1 show flm global

Display the information and settings for the firewall learning mode.

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

### 16.2.2 show flm interface

Display the interfaces selected for the firewall learning mode.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show flm interface`

# 17 HiDiscovery

## 17.1 network

Configure the inband and outband connectivity.

### 17.1.1 network hidiscovery operation

Enable/disable the HiDiscovery protocol on this device.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network hidiscovery operation <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | enable | Enable the HiDiscovery protocol. |
| | disable | Disable the HiDiscovery protocol. |

**no network hidiscovery operation**
Disable the option
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `no network hidiscovery operation <P-1>`

### 17.1.2 network hidiscovery mode

Set the access level for HiDiscovery.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network hidiscovery mode <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | read-write | Allow detection and configuration. |
| | read-only | Allow only detection, no configuration. |

### 17.1.3 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`

## 17.2 show

Display device options and settings.

### 17.2.1 show network hidiscovery

Display the HiDiscovery settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show network hidiscovery`

# 18 High Availability

## 18.1 high-availability

Configure high availability.

### 18.1.1 high-availability operation

Enable or disable high availability.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability operation`

- **no high-availability operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no high-availability operation`

### 18.1.2 high-availability role

Configure high availability role.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability role <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | none | `Clears the high availability role.` |
| | primary | `Sets the high availability role to primary.` |
| | secondary | `Sets the high availability role to secondary.` |

### 18.1.3 high-availability internal-vrrp

Configure high availability Internal VRRP-ID.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability internal-vrrp <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `VRRP ID 1 - 255` |

### 18.1.4 high-availability external-vrrp

Configure high availability external VRRP-ID.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability external-vrrp <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `VRRP ID 1 - 255` |

### 18.1.5 high-availability internal-vrrp-interface

Interface configured as internal VRRP link.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability internal-vrrp-interface <P-1>`

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

### 18.1.6 high-availability external-vrrp-interface

Interface configured as external VRRP link.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability external-vrrp-interface <P-1>`

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

### 18.1.7 high-availability primary ip

IP address of primary high availability unit.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability primary ip <P-1>`

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

### 18.1.8 high-availability primary prefix-length

Netmask prefix length of Primary high availability unit.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability primary prefix-length <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..32 | Prefix length netmask. |

### 18.1.9 high-availability primary ha-interface

Interface configured as high availability link.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability primary ha-interface <P-1>`

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

### 18.1.10 high-availability secondary ip

IP address of secondary high availability unit.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability secondary ip <P-1>`

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

### 18.1.11 high-availability secondary prefix-length

Netmask prefix length of secondary high availability unit.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability secondary prefix-length <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..32 | Prefix length netmask. |

### 18.1.12 high-availability secondary ha-interface

Interface configured as high availability link.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability secondary ha-interface <P-1>`

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

### 18.1.13 high-availability heartbeat-retries

Configure high availability Heartbeat retries.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability heartbeat-retries <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10 | Heartbeat retries 1 - 10 |

### 18.1.14 high-availability heartbeat-interval

Configure high availability heartbeat intervals (in seconds)

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability heartbeat-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..5 | Heartbeat inverval 1 - 5 in seconds |

### 18.1.15 high-availability security-mode

Enable or disable high availability security mode

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability security-mode <P-1>`

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

### 18.1.16 high-availability maintenance-mode

Enable or disable maintenance mode on standby device

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability maintenance-mode <P-1>`

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

### 18.1.17 high-availability security-key

Configure high availability security key

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `high-availability security-key <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Security Key |

## 18.2 ha-switch-over

Manual forced switchover to the peer standby node.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `ha-switch-over`

## 18.3 ha-config-sync

User configuration sync between high availability units.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `ha-config-sync`

## 18.4 show

Display device options and settings.

### 18.4.1 show high-availability status

Display the high availability state and configuration.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show high-availability status`

# 19 Hypertext Transfer Protocol (HTTP)

## 19.1 http

Set HTTP parameters.

### 19.1.1 http port

Set the HTTP port number.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `http port <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..65535 | `Port number of the HTTP server (default: 80).` |

### 19.1.2 http server

Enable or disable the HTTP server.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `http server`

**no http server**
Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no http server`

## 19.2 show

Display device options and settings.

### 19.2.1 show http

Display the HTTP server information.

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

# 20 HTTP Secure (HTTPS)

## 20.1 https

Set HTTPS parameters.

### 20.1.1 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`

### 20.1.2 https port

Set the HTTPS port number.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `https port <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..65535 | `Port number of the web server (default: 443).` |

### 20.1.3 https fingerprint-type

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | sha1 | `Configure sha1 fingerprint` |
| | sha256 | `Configure sha256 fingerprint` |

### 20.1.4 https certificate

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | generate | `Generates the item` |
| | delete | `Deletes the item` |

## 20.2 copy

Copy different kinds of items.

### 20.2.1 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`

`nvm`: Copy HTTPS certificate (PEM) from a server to the device.

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

### 20.2.2 copy httpscert envm

Copy X509/PEM certificate from external non-volatile memory to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy httpscert envm <P-1> nvm

nvm: Copy X509/PEM certificate from external non-volatile memory to the device.

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

## 20.3 show

Display device options and settings.

### 20.3.1 show https

Display the HTTPS server information.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show https

# 21 IGMP Querier

## 21.1 ip

Set IP parameters.

### 21.1.1 ip igmp-querier operation

Enable or disable IGMP querier globally on the system.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier operation`

- **no ip igmp-querier operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip igmp-querier operation`

### 21.1.2 ip igmp-querier interval

Sets the IGMP querier query interval time.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..1024 | `Enter value in range` |

### 21.1.3 ip igmp-querier response-interval

Sets the IGMP querier response interval.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier response-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..1024 | `Enter value in range` |

### 21.1.4 ip igmp-querier last-member-interval

Sets the IGMP query last member interval.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier last-member-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..1024 | `Enter value in range` |

### 21.1.5 ip igmp-querier robustness

Sets the IGMP querier robustness.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier robustness <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 2..10 | Enter a number in the given range |

## 21.2 ip

IP interface commands.

### 21.2.1 ip igmp-querier operation

Enable or disable IGMP querier instance.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier operation`

- **no ip igmp-querier operation**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no ip igmp-querier operation`

### 21.2.2 ip igmp-querier version

Sets the IGMP version (default:3).

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip igmp-querier version <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 2..3 | Enter igmp version. |

## 21.3 show

Display device options and settings.

### 21.3.1 show ip igmp-querier global

Display the general IGMP querier information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip igmp-querier global`

### 21.3.2 show ip igmp-querier interface

Display the interface specific information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip igmp-querier interface [<P-1>]`

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

# 22 Interface

## 22.1 shutdown

### 22.1.1 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`

## 22.2 auto-negotiate

### 22.2.1 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`

## 22.3 auto-power-down

### 22.3.1 auto-power-down

Set the auto-power-down mode on the interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `auto-power-down <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | auto-power-save | `The port goes in a low power mode.` |
| | no-power-save | `The port does not use the automatic power save mode.` |

## 22.4 cable-crossing

### 22.4.1 cable-crossing

Cable crossing settings on the interface. The cable crossing settings have no effect if auto-negotiation is enabled. In this case cable crossing is always set to auto. Cable crossing is set to the value chosen by the user if auto-negotiation is disabled.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `cable-crossing <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | mdi | `The port does not use the crossover mode.` |
| | mdix | `The port uses the crossover mode.` |
| | auto-mdix | `The port uses the auto crossover mode.` |

## 22.5 linktraps

### 22.5.1 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`

## 22.6 speed

### 22.6.1 speed

Sets the speed and duplex setting for the interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `speed <P-1> [<P-2>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | slot no./port no. | |

## 22.7 name

### 22.7.1 name

Set or remove a descriptive name for the interface.

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

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

## 22.8 power-state

### 22.8.1 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`

## 22.9 mac-filter

### 22.9.1 mac-filter

static mac filter configuration

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `mac-filter <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | aa:bb:cc:dd:ee:ff | `MAC address.` |
| `P-2` | 1..4042 | `Enter the VLAN ID.` |

**no mac-filter**
Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no mac-filter <P-1> <P-2>`

## 22.10 dhcp-client

### 22.10.1 dhcp-client

Enable/disable the DHCP client on the interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `dhcp-client`

**no dhcp-client**
Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no dhcp-client`

## 22.11 track

Set track parameters.

### 22.11.1 track if-status add

Set tracking object for interface status.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `track if-status add <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Track instance. |

### 22.11.2 track if-status delete

Delete tracking object for interface status.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `track if-status delete`

## 22.12 show

Display device options and settings.

### 22.12.1 show port

Display the interface parameters.

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

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

# 23 Interface Statistics

## 23.1 utilization

Configure the interface utilization parameters.

### 23.1.1 utilization control-interval

Add interval time to monitor the bandwidth utilization of the interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `utilization control-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..3600 | `Add interval time to monitor the bandwidth utilization.` |

### 23.1.2 utilization alarm-threshold lower

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..10000 | `Add alarm threshold lower value for monitoring bandwidth utilization in hundredths of a percent.` |

### 23.1.3 utilization alarm-threshold upper

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..10000 | `Add alarm threshold upper value for monitoring bandwidth utilization in hundredths of a percent.` |

## 23.2 clear

Clear several items.

### 23.2.1 clear port-statistics

Clear all statistics counter.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `clear port-statistics`

## 23.3 show

Display device options and settings.

### 23.3.1 show interface counters

Display the interface counters.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show interface counters`

### 23.3.2 show interface statistics

Display the summary interface statistics.

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

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

### 23.3.3 show interface ether-stats

Display the detailed interface statistics.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show interface ether-stats [<P-1>]`

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

# 24 Intern

## 24.1 help

Display the help text for various special keys.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `help`

## 24.2 logout

Exit this session.
- Mode: `Command is in all modes available.`
- Privilege Level: `any`
- Format: `logout`

## 24.3 history

Display a list of previously run commands.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `history`

## 24.4 vlan

Enter VLAN database mode.

### 24.4.1 vlan database

Enter VLAN database mode.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `vlan database`

## 24.5 exit

Exit from vlan mode.
- Mode: `VLAN Mode`
- Privilege Level: `Operator`
- Format: `exit`

## 24.6 end

Exit to exec mode.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `end`

## 24.7 serviceshell

Enter system mode.

### 24.7.1 serviceshell start

Start serviceshell prompt
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `serviceshell start`

### 24.7.2 serviceshell deactivate

Disable the service shell access permanently (Cannot be undone).
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `serviceshell deactivate`

## 24.8 traceroute

Trace route to a specified host.

## 24.9 traceroute

Trace route to a specified host.

### 24.9.1 traceroute source

Source address for traceroute command.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `traceroute <P-1> source <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IP address.` |
| `P-2` | A.B.C.D | `IP address.` |

## 24.10 reboot

Reset the device (cold start).
- Mode: `All Privileged Modes`
- Privilege Level: `any`
- Format: `reboot`

## 24.11 ping

Send ICMP echo packets to a specified IP address.

### 24.11.1 ping count

Number of retries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `ping <P-1> count <P-2>`

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

| Parameter | Value | Meaning |
|---|---|---|
| P-2 | 1..255 | Enter a number in the given range. |

## 24.12 ping

Send ICMP echo packets to a specified host or IP address.

### 24.12.1 ping source

Source address for ping command.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: ping <P-1> source <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IP address. |
| P-2 | A.B.C.D | IP address. |

## 24.13 show

Display device options and settings.

### 24.13.1 show serviceshell

Display the service shell access.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show serviceshell

# 25 Intrusion Detection System (IDS)

## 25.1 show

Display device options and settings.

### 25.1.1 show ids global

Display the information and settings for the intrusion detection system.

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

# 26 Open Shortest Path First (OSPF)

## 26.1 ip

Set IP parameters.

### 26.1.1 ip ospf area

Administer the OSPF areas. An area is a sub-division of an OSPF autonomous system. You identify an area by an area-id. OSPF networks, routers, and links that have the same area-id form a logical set.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf area <P-1> range add <P-2> <P-3> <P-4> modify <P-5> <P-6> <P-7> <P-8> delete <P-9> <P-10> <P-11> add delete stub add <P-12> modify <P-13> summarylsa <P-14> default-cost <P-15> delete <P-16> virtual-link add <P-17> delete <P-18> modify <P-19> authentication type <P-20> key <P-21> key-id <P-22> hello-interval <P-23> dead-interval <P-24> transmit-delay <P-25> retransmit-interval <P-26> nssa add <P-27> delete <P-28> modify translator role <P-29> stability-interval <P-30> summary no-redistribute default-info originate [metric <P-31>] [metric-type <P-32>]`

`range`: Configure the range for the area. You summarize the networks within this range into a single routing domain.
`add`: Create an area.
`modify`: Modify the parameters of an existing area.
`delete`: Delete a specific area.
`add`: Create a new area.
`delete`: Delete an existing area.
`stub`: Configure the preferences for a stub area. You shield stub areas from external route advertisements, but the area receives advertisements from networks that belong to other areas of the same autonomous system.
`add`: Create a stub area. The command also allows you to convert an existing area to a stub area.
`modify`: Modify the stub area parameters.
`summarylsa`: Configure the summary LSA mode for a stub area. When enabled, the router both summarizes and propagates summary LSAs.
`default-cost`: Set the default cost for the stub area.
`delete`: Remove a stub area. After removal, the area receives external route advertisements.
`virtual-link`: Configure a virtual link. You use the virtual link to connect the router to the backbone area (0.0.0.0) through a non-backbone area or to connect two parts of a partitioned backbone area (0.0.0.0) through a non-backbone area.
`add`: Add a virtual neighbor.
`delete`: Delete a virtual neighbor.
`modify`: Modify the parameters of a virtual neighbor.
`authentication`: Configure the authentication type. The device authenticates the OSPF protocol exchanges in the OSPF packet header which includes an authentication type field.
`type`: Configure the authentication type. Authentication types are 0 for null authentication, 1 for simple password authentication, and 2 for cryptographic authentication.
`key`: Configure the authentication key.
`key-id`: Configure the authentication key-id for md5 authentication. This field identifies the algorithm and secret key used to create the message digest appended to the OSPF packet.
`hello-interval`: Configure the OSPF hello-interval for the virtual link, in seconds. The hello timer controls the time interval between sending two consecutive hello packets. Set this value to the same hello-interval value of the virtual neighbors.
`dead-interval`: Configure the OSPF dead-interval for the virtual link, in seconds. If the timer expires without the router receiving hello packets from a virtual neighbor, the router declares the neighbor router as down. Set the timer to at least four times the value of the hello-interval.
`transmit-delay`: Configure the OSPF transmit-delay for the virtual link, in seconds. Transmit delay is the time that you estimate it takes to transmit a link-state update packet over the virtual link.
`retransmit-interval`: Configure the OSPF retransmit-interval for the virtual link, in seconds. The retransmit interval is the time between two consecutive link-state advertisement transmissions. Link-state advertisements contain such information as database descriptions and link-state request packets for adjacencies belonging to virtual link.

nssa: Configure a NSSA(Not-So-Stubby-Area).
add: Add a NSSA.
delete: Delete a NSSA.
modify: Modify the parameters of a NSSA.
translator: Configure the NSSA translator related parameters.
role: Configure the NSSA translator role.
stability-interval: Configure the translator stability interval for the NSSA, in seconds.
summary: Configure the import summary for the specified NSSA.
no-redistribute: Configure route redistribution for the specified NSSA.
default-info: Configure the nssa default information origination parameters.
originate: Configuration whether a Type-7 LSA should be originated into the NSSA.
[metric]: Configure the metric for the NSSA.
[metric-type]: Configure the metric type for default information.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IP address. |
| P-2 | summary-link | Configure summary links LSDB type optional mode. |
| | nssa-external-link | Configure nssa external link LSDB type optional mode. |
| P-3 | A.B.C.D | IPv4 address. |
| P-4 | A.B.C.D | IPv4 netmask address. |
| P-5 | summary-link | Configure summary links LSDB type optional mode. |
| | nssa-external-link | Configure nssa external link LSDB type optional mode. |
| P-6 | A.B.C.D | IPv4 address. |
| P-7 | A.B.C.D | IPv4 netmask address. |
| P-8 | advertise | Set as advertise. |
| | do-not-advertise | Set as do-not-advertise. |
| P-9 | summary-link | Configure summary links LSDB type optional mode. |
| | nssa-external-link | Configure nssa external link LSDB type optional mode. |
| P-10 | A.B.C.D | IPv4 address. |
| P-11 | A.B.C.D | IPv4 netmask address. |
| P-12 | 0 | Configure the TOS (0 is for Normal Service). |
| P-13 | 0 | Configure the TOS (0 is for Normal Service). |
| P-14 | no-area-summary | Disable the router from sending area link state advertisement summaries. |
| | send-area-summary | Enable the router to send area link state advertisement summaries. The router floods LSAs within the area using multicast. Every topology change starts a new flood of LSAs. |
| P-15 | 0..16777215 | Configure the default cost. |
| P-16 | 0 | Configure the TOS (0 is for Normal Service). |
| P-17 | A.B.C.D | IP address. |
| P-18 | A.B.C.D | IP address. |
| P-19 | A.B.C.D | IP address. |
| P-20 | none | Configure the authentication type as none (Key and key ID is not required). |
| | simple | Configure the authentication type as simple (Key ID is not required). |
| | md5 | Configure the authentication type as md5 for the interface. |
| P-21 | string | <key> Configure the authentication key. |
| P-22 | 0..255 | Enter a number in the given range. |
| P-23 | 1..65535 | Enter a number between 1 and 65535 |
| P-24 | 1..65535 | Enter a number between 1 and 65535 |
| P-25 | 0..3600 | Enter a number in the given range. |
| P-26 | 0..3600 | Enter a number in the given range. |
| P-27 | import-nssa | Configure the area as NSSA only. |
| P-28 | import-external | Change the area to support external LSAs also. |
| P-29 | always | Configure the NSSA translator role as always. When used as a border router, the router translates LSAs regardless of the translator states of the other NSSA border routers. |
| | candidate | Configure the NSSA translator role as a candidate. When used as a border router, the router participates in the translator election process. The router maintains a list of reachable NSSA border routers. |
| P-30 | 0..65535 | Enter a number between 0 and 65535 |
| P-31 | 1..16777214 | Configure the metric value. |
| P-32 | ospf-metric | Set the metric type as ospf Metric. |
| | comparable-cost | Set the metric type as comparable cost. |
| | non-comparable | Set the metric type as non-comparable. |

- **no ip ospf area**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip ospf area <P-1> range add modify delete add delete stub add modify summarylsa default-cost delete virtual-link add delete modify authentication type key key-id hello-interval dead-interval transmit-delay retransmit-interval nssa add delete modify translator role stability-interval summary no-redistribute default-info originate [metric] [metric-type]`

### 26.1.2 ip ospf trapflags all

Set all trapflags at once.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf trapflags all <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | [cr] | Enable the Bit. |

- **no ip ospf trapflags all**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip ospf trapflags all <P-1>`

### 26.1.3 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`

### 26.1.4 ip ospf 1583compatability

Enable or disable the 1583compatibility for calculating routes external to the autonomous system. When enabled, the router is compatible with the preference rules defined in RFC1583, section 16.4.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf 1583compatability`

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

### 26.1.5 ip ospf default-metric

Configure the default metric for re-distributed routes, when OSPF redistributes routes from other protocols.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf default-metric <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..16777214 | `Configure the default metric for redistributed routes.` |

- **no ip ospf default-metric**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip ospf default-metric <P-1>`

### 26.1.6 ip ospf router-id

Configure the router ID to uniquely identify this OSPF router in the autonomous system. If a tie occurs during the designated router election, the router with the higher router ID is the designated router.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf router-id <P-1>`

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

### 26.1.7 ip ospf external-lsdb-limit

Configure the OSPF external lsdb limitation, which is the maximum number of non-default AS-external-LSA entries that the router stores in the link-state database. When the value -1 is configured, you disable the limitation.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf external-lsdb-limit <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | -1..2147483647 | Configure the external lsdb limit. |

### 26.1.8 ip ospf exit-overflow

Configure the OSPF exit overflow interval, in seconds. After the timer expires the router will attempt to leave the overflow-state. To disable the exit overflow interval function set the value to 0.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf exit-overflow <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..2147483647 | Configure the exit overflow interval. |

### 26.1.9 ip ospf maximum-path

Configure the maximum number of paths that OSPF reports.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf maximum-path <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | Set the maximum path. |

### 26.1.10 ip ospf spf-delay

Configure the SPF delay, in seconds. The Shortest Path First (SPF) delay is the time that the device waits for the network to stabilize before calculating the shortest path tree, after a topology change.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf spf-delay <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..65535 | Enter a number between 0 and 65535 |

### 26.1.11 ip ospf spf-holdtime

Configure the minimum time between two consecutive SPF calculations, in seconds.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf spf-holdtime <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..65535 | Enter a number between 0 and 65535 |

### 26.1.12 ip ospf auto-cost

Set the auto cost reference bandwidth of the router interfaces for ospf metric calculations. The default reference bandwidth is 100 Mbps.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf auto-cost <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..4294967 | `Configure the auto cost for OSPF calculation.` |

### 26.1.13 ip ospf distance intra

Enter the preference type as intra. Use intra-area routing when the device routes packets solely within an area, such as an internal router.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf distance intra <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Enter the value.` |

### 26.1.14 ip ospf distance inter

Enter the preference type as inter. Use inter-area routing when the device routes packets into or out of an area, such as an area border router.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf distance inter <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Enter the value.` |

### 26.1.15 ip ospf distance external

Enter the preference type as external. Use external-area routing when the device routes packets into or out of an autonomous system, such as an autonomous system boundary router (ASBR).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf distance external <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Enter the value.` |

### 26.1.16 ip ospf re-distribute

Configure the OSPF route re-distribution. An ASBR is able to translate information from other OSPF processes in separate areas and routes from other sources, such as static routes or other dynamic routing protocols, into the OSPF protocol.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf re-distribute <P-1> [metric <P-2>] [metric-type <P-3>] [tag <P-4>] [subnets <P-5>]`

`[metric]`: Configure the OSPF route re-distribution metric parameters.
`[metric-type]`: Configure the OSPF route redistribution metric-type.
`[tag]`: Configure the OSPF route redistribution tag parameters.
`[subnets]`: Allow the router to redistribute subnets into OSPF.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | connected | `Select the source protocol as connected.` |
| | static | `Select the source protocol as static.` |
| `P-2` | 0..16777214 | `Configure the metric.` |
| `P-3` | 1..2 | `Configure the metric type.` |
| `P-4` | 0..4294967295 | `Configure the tag.` |
| `P-5` | enable | `Enable the option.` |
| | disable | `Disable the option.` |

■ **no ip ospf re-distribute**
Disable the option
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no ip ospf re-distribute <P-1> [metric] [metric-type] [tag] [subnets]`

### 26.1.17 ip ospf distribute-list

Configure the distribute list for the routes from other source protocols.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip ospf distribute-list <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | out | `Configure as out to re-distribute routes with ACL rules` |
| `P-2` | connected | `Select the source protocol as connected.` |
| | static | `Select the source protocol as static.` |
| `P-3` | <1000..1099> | `Enter the access list number.` |

■ **no ip ospf distribute-list**
Disable the option
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no ip ospf distribute-list <P-1> <P-2> <P-3>`

### 26.1.18 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]`

## 26.2 ip

IP interface commands.

### 26.2.1 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`

### 26.2.2 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. |

### 26.2.3 ip ospf link-type

Configure the OSPF link type.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip ospf link-type <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | broadcast | Configure the link-type as broadcast for the interface. In broadcast networks, routers discover their neighbors dynamically using the OSPF hello protocol. |
| | nbma | Configure the link-type as Non-Broadcast Multi-Access for the interface. The nbma mode, emulates OSPF operation over a broadcast network. The nbma mode is the most efficient way to run OSPF over non-broadcast networks, both in terms of the LSDB size and the amount of routing protocol traffic. However, this mode requires direct communication between every router in the nbma network. |
| | point-to-point | Configure the link-type as point-to-point for the interface. Use the point-to-point link-type in a network that joins a single pair of routers. |
| | point-to-multipoint | Configure the link-type as point-to-multipoint for the interface. In the point-to-multipoint mode, OSPF treats each router-to-router link over non-broadcast networks as if they were point-to-point links. |

### 26.2.4 ip ospf priority

Configure the OSPF router priority which the router uses in multi-access networks for the designated router election algorithm. The router with the higher router priority is the designated router. A value of 0 declares the router as ineligible for designated router elections.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..255 | Configure the priority. |

### 26.2.5 ip ospf transmit-delay

Configure the OSPF transmit-delay for the interface, in seconds. The transmit-delay is the time that you estimate it takes to transmit a link-state update packet over the interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip ospf transmit-delay <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..3600 | Enter a number in the given range. |

### 26.2.6 ip ospf retransmit-interval

Configure the OSPF retransmit-interval for the interface, in seconds. The retransmit-interval is the interval after which link-state advertisements containing database description and link-state request packets, are re-transmitted for adjacencies belonging to this interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip ospf retransmit-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..3600 | Enter a number in the given range. |

### 26.2.7 ip ospf hello-interval

Configure the OSPF hello-interval for the interface, in seconds. The hello timer controls the time interval between two consecutive hello packets. Set this value to the same hello-interval value of the neighbor.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip ospf hello-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..65535 | Enter a number between 1 and 65535 |

### 26.2.8 ip ospf dead-interval

Configure the OSPF dead-interval for the interface, in seconds. If the timer expires without the router receiving hello packets from the neighbor, the router declares the neighbor router as down. Set the timer to at least four times the value of the hello-interval.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip ospf dead-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..65535 | Enter a number between 1 and 65535 |

### 26.2.9 ip ospf cost

Configure the OSPF cost for the interface. The cost of a specific interface indicates the overhead required to send packets across the link. If set to 0, OSPF calculates the cost from the reference bandwidth and the interface speed.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | <1..65535> | Configure the cost for the specified interface. |
| | auto | Automatic calculation from reference bandwidth and link speed. |

### 26.2.10 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`

### 26.2.11 ip ospf authentication type

Configure authentication type.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | none | Configure the authentication type as none (Key and key ID is not required). |
| | simple | Configure the authentication type as simple (Key ID is not required). |
| | md5 | Configure the authentication type as md5 for the interface. |

### 26.2.12 ip ospf authentication key

Configure authentication key.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <key> Configure the authentication key. |

### 26.2.13 ip ospf authentication key-id

Configure authentication key-id for md5 authentication.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..255 | Enter a number in the given range. |

## 26.3 show

Display device options and settings.

### 26.3.1 show ip ospf global

Display the OSPF global configurations.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf global`

### 26.3.2 show ip ospf area

Display the OSPF area related information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf area [<P-1>]`

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

### 26.3.3 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`

### 26.3.4 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`

### 26.3.5 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`

### 26.3.6 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`

### 26.3.7 show ip ospf interface

Display the OSPF interface related information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf interface [<P-1>]`

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

### 26.3.8 show ip ospf virtual-link

Display the OSPF virtual-link related information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf virtual-link <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IP address. |
| P-2 | A.B.C.D | IP address. |

### 26.3.9 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`

### 26.3.10 show ip ospf neighbor

Display the OSPF neighbor related information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf neighbor [<P-1>]`

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

### 26.3.11 show ip ospf statistics

Display the OSPF statistics.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf statistics`

### 26.3.12 show ip ospf re-distribute

Display the OSPF re-distribute related information

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf re-distribute <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | connected | `Select the source protocol as connected.` |
| | static | `Select the source protocol as static.` |

### 26.3.13 show ip ospf nssa

Display the OSPF NSSA related information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf nssa <P-1>`

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

### 26.3.14 show ip ospf route

Display the OSPF routes.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip ospf route`

# 27 Virtual Router Redundancy Protocol (VRRP)

## 27.1 ip

Set IP parameters.

### 27.1.1 ip vrrp operation

Enables or disables VRRP globally on the device.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp operation`

- **no ip vrrp operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip vrrp operation`

### 27.1.2 ip vrrp trap auth-failure

Enable or disable the sending of a trap if this router detects an authentication failure on any of its VRRP interfaces.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp trap auth-failure`

- **no ip vrrp trap auth-failure**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip vrrp trap auth-failure`

### 27.1.3 ip vrrp trap new-master

Enable or disable the sending of a trap if this router becomes new master for any of its VRRP interfaces.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp trap new-master`

- **no ip vrrp trap new-master**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ip vrrp trap new-master`

## 27.2 ip

IP interface commands.

### 27.2.1 ip vrrp add

Create a new VRRP instance.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp add <P-1> [priority <P-2>] [interval <P-3>] [preempt <P-4>] [master-candidate <P-5>] [proxy-arp <P-6>]`

`[priority]`: Priority of the virtual router ..... default 100
`[interval]`: Advertisement Interval in seconds .. default 1
`[preempt]`: Enables or disables preempt mode ... default enabled

[master-candidate]: Master Candidate Address ..... default 0.0.0.0
[proxy-arp]: Enables or disables proxy ARP on the virtual interface....default disabled

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | 1..254 | Enter a priority value. |
| P-3 | 1..255 | Enter a number in the given range. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |
| P-5 | A.B.C.D | IP address. |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |

### 27.2.2 ip vrrp modify

Modify parameters of a VRRP instance.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp modify <P-1> [priority <P-2>] [interval <P-3>] [preempt <P-4>] [master-candidate <P-5>] [proxy-arp <P-6>]

[priority]: Priority of the virtual router
[interval]: Advertisement Interval in seconds
[preempt]: Enables or disables preemption mode
[master-candidate]: The IP Address that shows as Master IP Address when this Virtual Router becomes Master
[proxy-arp]: Enables or disables proxy ARP on the virtual interface when the state changes to master

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | 1..254 | Enter a priority value. |
| P-3 | 1..255 | Enter a number in the given range. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |
| P-5 | A.B.C.D | IP address. |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |

### 27.2.3 ip vrrp delete

Delete a VRRP instance.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |

### 27.2.4 ip vrrp enable

Enable a VRRP instance.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp enable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |

### 27.2.5 ip vrrp disable

Disable a VRRP instance.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip vrrp disable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |

### 27.2.6 ip vrrp virtual-address add

Add a virtual address.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp virtual-address add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | A.B.C.D | IP address. |

### 27.2.7 ip vrrp virtual-address delete

Delete a virtual address.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp virtual-address delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | A.B.C.D | IP address. |

### 27.2.8 ip vrrp track add

Add a tracking object to the vrrp instance.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp track add <P-1> <P-2> [decrement <P-3>]`

`[decrement]`: Configure the decrement value. Default is 20

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | string | Track instance. |
| P-3 | 1..253 | Enter the decrement value. The priority will be decremented by the configured value |

### 27.2.9 ip vrrp track modify

Modify a tracking object to the vrrp instance.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp track modify <P-1> <P-2> decrement <P-3>`

`decrement`: Configure the decrement value. Default is 20

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | string | Track instance. |
| P-3 | 1..253 | Enter the decrement value. The priority will be decremented by the configured value |

### 27.2.10 ip vrrp track delete

Delete a tracking object to the vrrp instance.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip vrrp track delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a virtual router ID. |
| P-2 | string | Track instance. |

## 27.3 show

Display device options and settings.

### 27.3.1 show ip vrrp interface

Display the parameters of one VRRP instances.

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | 1..255 | `Enter a virtual router ID.` |

### 27.3.2 show ip vrrp global

Display the global VRRP parameters.

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

# 28 Address Resolution Protocol (IP ARP)

## 28.1 ip

Set IP parameters.

### 28.1.1 ip arp add

Add a static arp entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IP address. |
| P-2 | aa:bb:cc:dd:ee:ff | MAC address. |

### 28.1.2 ip arp delete

Delete a static arp entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp delete <P-1>`

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

### 28.1.3 ip arp enable

Enable a static arp entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | a.b.c.d | IP address. |

### 28.1.4 ip arp disable

Disable a static arp entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | a.b.c.d | IP address. |

### 28.1.5 ip arp timeout

Configure ARP entry age-out time (in seconds).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp timeout <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 15..21600 | Enter the arp response time. |

### 28.1.6 ip arp response-time

Configure ARP request response timeout (in seconds).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp response-time <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..10 | Enter the arp response time. |

### 28.1.7 ip arp retries

Configure ARP count of maximum requests for retries.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip arp retries <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..10 | `Enter the arp max retries.` |

## 28.2 show

Display device options and settings.

### 28.2.1 show ip arp info

Display the ARP summary information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip arp info`

### 28.2.2 show ip arp table

Display the ARP cache entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip arp table`

### 28.2.3 show ip arp static

Display the static ARP entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip arp static`

### 28.2.4 show ip arp entry

Display the ARP cache entry.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip arp entry <P-1>`

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

## 28.3 clear

Clear several items.

### 28.3.1 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.

# 29 Internet Protocol Version 4 (IPv4)

## 29.1 network

Configure the inband and outband connectivity.

### 29.1.1 network parms

Set network address, netmask and gateway
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network parms <P-1> <P-2> [<P-3>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IPv4 address.` |
| `P-2` | A.B.C.D | `IPv4 netmask address.` |
| `P-3` | A.B.C.D | `IPv4 gateway address.` |

## 29.2 clear

Clear several items.

### 29.2.1 clear arp-table-switch

Clear the agent's ARP table (cache).
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `clear arp-table-switch`

## 29.3 show

Display device options and settings.

### 29.3.1 show network parms

Display the network settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show network parms`

## 29.4 show

Display device options and settings.

### 29.4.1 show arp

Display the ARP table.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show arp`

# 30 Link Layer Discovery Protocol (LLDP)

## 30.1 lldp

Configure of Link Layer Discovery Protocol.

### 30.1.1 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`

### 30.1.2 lldp config chassis admin-state

Enable or disable the LLDP operational state.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `lldp config chassis admin-state <P-1>`

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

### 30.1.3 lldp config chassis notification-interval

Enter the LLDP notification interval in seconds.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `lldp config chassis notification-interval <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 5..3600 | `Enter a number in the given range.` |

### 30.1.4 lldp config chassis re-init-delay

Enter the LLDP re-initialization delay in seconds.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `lldp config chassis re-init-delay <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..10 | `Enter a number in the given range.` |

### 30.1.5 lldp config chassis tx-delay

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..8192 | `Enter a number in the given range (tx-delay smaller than (0.25 × tx-interval)` |

### 30.1.6 lldp config chassis tx-hold-multiplier

Enter the LLDP transmit hold multiplier.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `lldp config chassis tx-hold-multiplier <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 2..10 | Enter a number in the given range. |

### 30.1.7 lldp config chassis tx-interval

Enter the LLDP transmit interval in seconds.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: lldp config chassis tx-interval <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 5..32768 | Enter a number in the given range. |

## 30.2 show

Display device options and settings.

### 30.2.1 show lldp global

Display the LLDP global configurations.

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

### 30.2.2 show lldp port

Display the port specific LLDP configurations.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lldp port [<P-1>]

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

### 30.2.3 show lldp remote-data

Remote information collected with LLDP.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show lldp remote-data [<P-1>]

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

## 30.3 lldp

Configure of Link Layer Discovery Protocol on a port.

### 30.3.1 lldp admin-state

Configure how the interface processes LLDP frames.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: lldp admin-state <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | tx-only | Interface will only transmit LLDP frames. Received frames are not processed. |
| | rx-only | Interface will only receive LLDP frames. Frames are not transmitted. |
| | tx-and-rx | Interface will transmit and receive LLDP frames. This is the default setting. |
| | disable | Interface will neither transmit nor process received LLDP frames. |

### 30.3.2 lldp fdb-mode

Configure the LLDP FDB mode for this interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp fdb-mode <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | lldp-only | Collected remote data will be based on received LLDP frames only. |
| | mac-only | Collected remote data will be based on the switch's FDB entries only. |
| | both | Collected remote data will be based on received LLDP frames as well as on the switch's FDB entries. |
| | auto-detect | As long as no LLDP frames are received, the collected remote data will be based on the switch's FDB entries only. After the first LLDP frame is received, the remote data will be based on received LLDP frames only. This is the default setting. |

### 30.3.3 lldp max-neighbors

Enter the LLDP max neighbors for interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp max-neighbors <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Enter a number in the given range. |

### 30.3.4 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`

### 30.3.5 lldp tlv mac-phy-config-state

Enable or disable mac-phy-config-state TLV transmission.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv mac-phy-config-state <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | [cr] | Enable the Bit. |

**no lldp tlv mac-phy-config-state**

Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no lldp tlv mac-phy-config-state <P-1>`

### 30.3.6 lldp tlv max-frame-size

Enable or disable max-frame-size TLV transmission.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv max-frame-size <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | [cr] | Enable the Bit. |

- **no lldp tlv max-frame-size**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no lldp tlv max-frame-size <P-1>`

### 30.3.7 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`

### 30.3.8 lldp tlv port-desc

Enable or disable port description TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv port-desc <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | [cr] | Enable the Bit. |

- **no lldp tlv port-desc**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no lldp tlv port-desc <P-1>`

### 30.3.9 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`

### 30.3.10 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`

### 30.3.11 lldp tlv sys-cap

Enable or disable system capabilities TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv sys-cap <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | [cr] | Enable the Bit. |

**no lldp tlv sys-cap**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no lldp tlv sys-cap <P-1>`

### 30.3.12 lldp tlv sys-desc

Enable or disable system description TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv sys-desc <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | [cr] | Enable the Bit. |

**no lldp tlv sys-desc**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no lldp tlv sys-desc <P-1>`

### 30.3.13 lldp tlv sys-name

Enable or disable system name TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv sys-name <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | [cr] | Enable the Bit. |

**no lldp tlv sys-name**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no lldp tlv sys-name <P-1>`

### 30.3.14 lldp tlv vlan-name

Enable or disable vlan name TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv vlan-name`

**no lldp tlv vlan-name**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no lldp tlv vlan-name`

### 30.3.15 lldp tlv protocol-based-vlan

Enable or disable protocol-based vlan TLV transmission.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `lldp tlv protocol-based-vlan`

- **no lldp tlv protocol-based-vlan**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no lldp tlv protocol-based-vlan`

# 31 Logging

## 31.1 logging

Logging configuration.

### 31.1.1 logging audit-trail

Add a comment for the audit trail.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging audit-trail <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 80 characters. |

### 31.1.2 logging buffered severity

Configure the minimum severity level to be logged to the high priority buffer.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging buffered severity <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

### 31.1.3 logging host add

Add a new logging host.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging host add <P-1> addr <P-2> [transport <P-3>] [port <P-4>] [severity <P-5>] [type <P-6>]`

`addr`: Enter the IP address of the server.
`[transport]`: Configure the type of transport used for syslog server transmission.
`[port]`: Enter the port used for syslog server transmission.
`[severity]`: Configure the minimum severity level to be sent to this syslog server.
`[type]`: Configure the type of log messages to be sent to the syslog server.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Syslog server entry index |
| P-2 | A.B.C.D | IP address. |
| P-3 | udp | The UDP-based transmission. |
| | tls | The TLS-based transmission. |
| P-4 | 1..65535 | Port number to be used |

| Parameter | Value | Meaning |
|---|---|---|
| P-5 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |
| P-6 | systemlog | the system event log entries |
| | audittrail | the audit trail log entries |

### 31.1.4 logging host delete

Delete a logging host.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Syslog server entry index |

### 31.1.5 logging host enable

Enable a logging host.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Syslog server entry index |

### 31.1.6 logging host disable

Disable a logging host.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Syslog server entry index |

### 31.1.7 logging host modify

Modify an existing logging host.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: logging host modify <P-1> [addr <P-2>] [transport <P-3>] [port <P-4>] [severity <P-5>] [type <P-6>]

[addr]: Enter the IP address of the server.
[transport]: Configure the type of transport used for syslog server transmission.
[port]: Enter the port used for syslog server transmission.
[severity]: Configure the minimum severity level to be sent to this syslog server.
[type]: Configure the type of log messages to be sent to the syslog server.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Syslog server entry index |
| P-2 | A.B.C.D | IP address. |
| P-3 | udp | The UDP-based transmission. |
| | tls | The TLS-based transmission. |
| P-4 | 1..65535 | Port number to be used |

| Parameter | Value | Meaning |
|---|---|---|
| P-5 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |
| P-6 | systemlog | the system event log entries |
| | audittrail | the audit trail log entries |

### 31.1.8 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`

### 31.1.9 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`

### 31.1.10 logging current-console severity

Configure the minimum severity level to be sent to the current remote console.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging current-console severity <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

### 31.1.11 logging console operation

Enable or disable logging to the local V.24 console.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging console operation`

- **no logging console operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no logging console operation`

### 31.1.12 logging console severity

Configure the minimum severity level to be logged to the V.24 console.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging console severity <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

### 31.1.13 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`

### 31.1.14 logging persistent numfiles

Enter the maximum number of log files.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging persistent numfiles <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..25 | number of logfiles |

### 31.1.15 logging persistent filesize

Enter the maximum size of a log file.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging persistent filesize <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..4096 | Maximum persistent logfile size on the non-volatile memory in kBytes |

### 31.1.16 logging persistent severity-level

Configure the minimum severity level to be logged into files.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging persistent severity-level <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

## 31.2 show

Display device options and settings.

### 31.2.1 show logging buffered

Display the buffered (in-memory) log entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show logging buffered [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <filter> Enter a comma separated list of severity ranges, numbers or enum strings are allowed. Example: 0-1,informational-debug |

### 31.2.2 show logging traplogs

Display the trap log entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show logging traplogs`

### 31.2.3 show logging console

Display the console logging configurations.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show logging console`

### 31.2.4 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.

### 31.2.5 show logging syslog

Display the current syslog operational setting.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show logging syslog`

### 31.2.6 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`

## 31.3 copy

Copy different kinds of items.

### 31.3.1 copy eventlog buffered envm

Copy a buffered log from the device to external non-volatile memory.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `copy eventlog buffered envm <P-1>`

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

### 31.3.2 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>`

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

### 31.3.3 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>`

`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.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 32 characters. |
| P-2 | string | Enter a user-defined text, max. 32 characters. |
| P-3 | string | Enter a user-defined text, max. 128 characters. |

### 31.3.4 copy traplog system envm

Copy the traplog from the device to external non-volatile memory.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `copy traplog system envm <P-1>`

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

### 31.3.5 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>`

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

### 31.3.6 copy audittrail system envm

Copy the audit trail from the device to external non-volatile memory.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator, Auditor`
- Format: `copy audittrail system envm <P-1>`

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

### 31.3.7 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>`

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

## 31.4 clear

Clear several items.

### 31.4.1 clear logging buffered

Clear buffered log from memory.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear logging buffered`

### 31.4.2 clear logging persistent

Clear persistent log from memory.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear logging persistent`

### 31.4.3 clear eventlog

Clear the event log entries from memory.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear eventlog`

# 32 Management Access

## 32.1 network

Configure the inband and outband connectivity.

### 32.1.1 network management access web timeout

Set the web interface idle timeout.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `network management access web timeout <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..160 | Idle timeout of a session in minutes (default: 5). |

### 32.1.2 network management access add

Add a new entry with index.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `network management access add <P-1> [interface <P-2>] [ip <P-3>] [mask <P-4>] [http <P-5>] [https <P-6>] [snmp <P-7>] [ssh <P-8>]`

`[interface]`: Configure interface index on which management access should be restricted or allowed.
`[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.
`[ssh]`: Configure if SSH is allowed to have management access.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Pool entry index. |
| P-2 | slot no./port no. | |
| P-3 | A.B.C.D | IP address. |
| P-4 | 0..32 | Prefix length netmask. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |

### 32.1.3 network management access delete

Delete an entry with index.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `network management access delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Pool entry index. |

### 32.1.4 network management access modify

Modify an entry with index.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `network management access modify <P-1> interface <P-2> ip <P-3> mask <P-4> http <P-5> https <P-6> snmp <P-7> ssh <P-8>`

`[interface]`: Configure interface index on which management access should be restricted or allowed.
`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.
[ssh]: Configure if SSH is allowed to have management access.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Pool entry index. |
| P-2 | slot no./port no. | |
| P-3 | A.B.C.D | IP address. |
| P-4 | 0..32 | Prefix length netmask. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | enable | Enable the option. |
| | disable | Disable the option. |
| P-8 | enable | Enable the option. |
| | disable | Disable the option. |

### 32.1.5 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

### 32.1.6 network management access status

Activate/Deactivate an entry.
- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: network management access status <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Pool entry index. |

**no network management access status**
Disable the option
- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: no network management access status <P-1>

## 32.2 show

Display device options and settings.

### 32.2.1 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

### 32.2.2 show network management access rules

Display the restricted management access rules.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show network management access rules [<P-1>]

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Pool entry index. |

# 33 Network Address Translation (NAT)

## 33.1 nat

Manage NAT rules

### 33.1.1 nat dnat commit

Commit pending changes for DNAT (commits all NAT changes).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat dnat commit`

### 33.1.2 nat dnat add

Add rule to DNAT

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat dnat add <P-1> [cfg <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> [<P-9>]] [cfg]`: Configure the rule immediately

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |
| P-2 | a.b.c.d | Source IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-3 | number | number UDP/TCP Source Port |
| | nu-nu | nu-nu Port Range |
| | nu,nu-nu | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-4 | a.b.c.d | Destination IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-5 | number | number of the UDP/TCP Destination Port |
| | nu-nu | nu-nu Port Range |
| | number,number | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-6 | a.b.c.d | New destination IP address |
| P-7 | number | number of the UDP/TCP New Destination Port |
| | any | any Any port (or protocol without a port) |
| P-8 | icmp | Internet Control Message Protocol |
| | igmp | Internet Group Management Protocol |
| | ipip | IP-within-IP Encapsulation Protocol |
| | tcp | Transmission Control Protocol |
| | udp | User Datagram Protocol |
| | esp | Encapsulating Security Protocol |
| | ah | Authentication Header |
| | any | Any of the above |
| P-9 | string | Rule description/name |

### 33.1.3 nat dnat modify

Configure single DNAT rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat dnat modify <P-1> <P-2> <P-3> <P-4> <P-5> <P-6> <P-7> <P-8> [<P-9>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |

| Parameter | Value | Meaning |
|---|---|---|
| P-2 | a.b.c.d | Source IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-3 | number | number UDP/TCP Source Port |
| | nu-nu | nu-nu Port Range |
| | nu,nu-nu | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-4 | a.b.c.d | Destination IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-5 | number | number of the UDP/TCP Destination Port |
| | nu-nu | nu-nu Port Range |
| | number,number | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-6 | a.b.c.d | New destination IP address |
| P-7 | number | number of the UDP/TCP New Destination Port |
| | any | any Any port (or protocol without a port) |
| P-8 | icmp | Internet Control Message Protocol |
| | igmp | Internet Group Management Protocol |
| | ipip | IP-within-IP Encapsulation Protocol |
| | tcp | Transmission Control Protocol |
| | udp | User Datagram Protocol |
| | esp | Encapsulating Security Protocol |
| | ah | Authentication Header |
| | any | Any of the above |
| P-9 | string | Rule description/name |

### 33.1.4 nat dnat delete

Delete rule from DNAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |

### 33.1.5 nat dnat logtrap

Set log/trap for DNAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat logtrap <P-1> <P-2> <P-3>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |
| P-2 | no | Disable Logging |
| | yes | Enable Logging |
| P-3 | no | Disable SNMP Trap |
| | yes | Enable SNMP Trap |

### 33.1.6 nat dnat state

Enable/Disable specific DNAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat dnat state <P-1> <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

### 33.1.7 nat dnat if add

Add Interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat dnat if add <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | 1..255 | `DNAT rule number` |
| `P-3` | 0..6500 | `Priority` |

### 33.1.8 nat dnat if delete

Delete interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat dnat if delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | 1..255 | `DNAT rule number` |

### 33.1.9 nat 1to1nat commit

Commit pending changes for 1:1 NAT (commits every NAT change).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat 1to1nat commit`

### 33.1.10 nat 1to1nat add

Add rule to 1:1 NAT

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat 1to1nat add <P-1> [cfg <P-2> <P-3> <P-4>] [ingress <P-5>] [egress <P-6> [<P-7>]]`

`[cfg]`: Configure the rule immediately
`[ingress]`: Configure ingress interface
`[egress]`: Configure egress interface

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..256 | `1:1 NAT rule number` |
| `P-2` | a.b.c.d | `Virtual destination IP address` |
| | a.b.c.d/n | `CIDR mask` |
| `P-3` | a.b.c.d | `Actual destination IP address` |
| | a.b.c.d/n | `CIDR mask` |
| `P-4` | 0..6500 | `Priority` |
| `P-5` | slot no./port no. | |
| `P-6` | slot no./port no. | |
| `P-7` | string | `Rule description/name` |

### 33.1.11 nat 1to1nat modify

Configure single 1:1 NAT rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat 1to1nat modify <P-1> <P-2> <P-3> <P-4> [ingress <P-5>] [egress <P-6> [<P-7>]]`

`[ingress]`: Configure ingress interface
`[egress]`: Configure egress interface

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..256 | `1:1 NAT rule number` |
| `P-2` | a.b.c.d | `Virtual destination IP address` |
| | a.b.c.d/n | `CIDR mask` |
| `P-3` | a.b.c.d | `Actual destination IP address` |
| | a.b.c.d/n | `CIDR mask` |
| `P-4` | 0..6500 | `Priority` |
| `P-5` | slot no./port no. | |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | slot no./port no. | |
| P-7 | string | Rule description/name |

### 33.1.12 nat 1to1nat delete

Delete the rule from 1:1 NAT

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | 1:1 NAT rule number |

### 33.1.13 nat 1to1nat logtrap

Set log/trap for 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat logtrap <P-1> <P-2> <P-3>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | 1:1 NAT rule number |
| P-2 | no | Disable Logging |
| | yes | Enable Logging |
| P-3 | no | Disable SNMP Trap |
| | yes | Enable SNMP Trap |

### 33.1.14 nat 1to1nat state

Enable/Disable specific 1:1 NAT rule

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat 1to1nat state <P-1> <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | 1:1 NAT rule number |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

### 33.1.15 nat masq commit

Commit pending changes for Masquerading (commits every NAT change).

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq commit

### 33.1.16 nat masq add

Add rule to Masquerading

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: nat masq add <P-1> [cfg <P-2> <P-3> <P-4> [<P-5>]]

[cfg]: Configure the rule immediately

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |
| P-2 | a.b.c.d | Source IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-3 | number | number UDP/TCP Source Port |
| | nu-nu | nu-nu Port Range |
| | nu,nu-nu | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-4 | tcp | Transmission Control Protocol |
| | udp | User Datagram Protocol |
| | any | Any protocol at all |
| P-5 | string | Rule description/name |

### 33.1.17 nat masq modify

Configure single Masquerading rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq modify <P-1> <P-2> <P-3> <P-4> [<P-5>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |
| P-2 | a.b.c.d | Source IP address |
| | a.b.c.d/n | CIDR mask |
| | !a.b.c.d | !<a.b.c.d> Everything BUT this address |
| | !a.b.c.d/n | !<a.b.c.d/n> Everything BUT this CIDR mask |
| | any | any Any |
| P-3 | number | number UDP/TCP Source Port |
| | nu-nu | nu-nu Port Range |
| | nu,nu-nu | nu,nu-nu List of ports (or port ranges) |
| | any | any Any port (or protocol without a port) |
| P-4 | tcp | Transmission Control Protocol |
| | udp | User Datagram Protocol |
| | any | Any protocol at all |
| P-5 | string | Rule description/name |

### 33.1.18 nat masq delete

Delete rule from Masquerading

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |

### 33.1.19 nat masq logtrap

Set log/trap for Masquerading rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq logtrap <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |
| P-2 | no | Disable Logging |
| | yes | Enable Logging |
| P-3 | no | Disable SNMP Trap |
| | yes | Enable SNMP Trap |

### 33.1.20 nat masq ipsec-exempt

Exclude IPsec traffic from Masquerading rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq ipsec-exempt <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |
| P-2 | disabled | Apply rule to IPsec traffic |
| | enabled | Do not apply rule to IPsec traffic |

### 33.1.21 nat masq state

Enable/Disable specific Masquerading rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq state <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

### 33.1.22 nat masq if add

Add interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq if add <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | 1..128 | `Masquerading rule number` |
| `P-3` | 0..6500 | `Priority` |

### 33.1.23 nat masq if delete

Delete interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat masq if delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | 1..128 | `Masquerading rule number` |

### 33.1.24 nat doublenat commit

Commit pending changes for Double NAT (commits all NAT changes).

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat commit`

### 33.1.25 nat doublenat add

Add rule to Double NAT

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat add <P-1> [cfg <P-2> <P-3> <P-4> <P-5> [<P-6>]]`

`[cfg]`: Configure the rule immediately

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Double NAT rule number` |
| `P-2` | a.b.c.d | `Local internal IP address` |
| `P-3` | a.b.c.d | `Local external IP address` |
| `P-4` | a.b.c.d | `Remote Internal IP Address` |
| `P-5` | a.b.c.d | `Remote External IP Address` |
| `P-6` | string | `Rule description/name` |

### 33.1.26 nat doublenat modify

Configure single Double NAT rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat modify <P-1> <P-2> <P-3> <P-4> <P-5> [<P-6>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Double NAT rule number` |
| `P-2` | a.b.c.d | `Local internal IP address` |
| `P-3` | a.b.c.d | `Local external IP address` |
| `P-4` | a.b.c.d | `Remote Internal IP Address` |
| `P-5` | a.b.c.d | `Remote External IP Address` |
| `P-6` | string | `Rule description/name` |

### 33.1.27 nat doublenat delete

Delete rule from Double NAT

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..255 | `Double NAT rule number` |

### 33.1.28 nat doublenat logtrap

Set log/trap for Double NAT rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat logtrap <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Double NAT rule number |
| P-2 | no | Disable Logging |
| | yes | Enable Logging |
| P-3 | no | Disable SNMP Trap |
| | yes | Enable SNMP Trap |

### 33.1.29 nat doublenat state

Enable/Disable specific Double NAT rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat state <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Double NAT rule number |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

### 33.1.30 nat doublenat if add

Add Interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat if add <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | ingress | Ingress |
| | egress | Egress |
| | both | Both |
| P-3 | 1..255 | Double NAT rule number |
| P-4 | 0..6500 | Priority |

### 33.1.31 nat doublenat if delete

Delete interface

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat doublenat if delete <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | ingress | Ingress |
| | egress | Egress |
| | both | Both |
| P-3 | 1..255 | Double NAT rule number |

### 33.1.32 nat nat64 add

Add rule to NAT64

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat nat64 add <P-1> <P-2> <P-3> <P-4> <P-5>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | NAT64 rule number |
| P-2 | string | NAT64 Rule name |
| P-3 | a:b:c:d:e:f:g:h | IPv6 address |
| P-4 | 0..128 | IPv6 prefix length |
| P-5 | Stateless | Stateless mode |
| | Stateful | Stateful mode |

### 33.1.33 nat nat64 modify

Configure single NAT64 rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat nat64 modify <P-1> <P-2> <P-3> <P-4> <P-5>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | NAT64 rule number |
| P-2 | string | NAT64 Rule name |
| P-3 | a:b:c:d:e:f:g:h | IPv6 address |
| P-4 | 0..128 | IPv6 prefix length |
| P-5 | Stateless | Stateless mode |
| | Stateful | Stateful mode |

### 33.1.34 nat nat64 delete

Delete rule from NAT64

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat nat64 delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | NAT64 rule number |

### 33.1.35 nat nat64 state

Enable/Disable specific NAT64 rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `nat nat64 state <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | NAT64 rule number |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

## 33.2 show

Display device options and settings.

### 33.2.1 show nat dnat global

Display the summary.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat dnat global`

### 33.2.2 show nat dnat rules

Display the DNAT rules.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat dnat rules [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |

### 33.2.3 show nat dnat if

Display the DNAT interface configuration.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat dnat if`

### 33.2.4 show nat dnat logtrap

Display the Log/Trap settings for the DNAT rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat dnat logtrap [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | DNAT rule number |

### 33.2.5 show nat masq global

Display the summary.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat masq global`

### 33.2.6 show nat masq rules

Display the masquerading rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat masq rules [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |

### 33.2.7 show nat masq logtrap

Display the Log/Trap settings for the masquerading rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat masq logtrap [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..128 | Masquerading rule number |

### 33.2.8 show nat masq if

Display the masquerading interface configuration.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat masq if`

### 33.2.9 show nat 1to1nat global

Display the summary.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat 1to1nat global`

### 33.2.10 show nat 1to1nat rules

Display the 1:1 NAT rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat 1to1nat rules [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | 1:1 NAT rule number |

### 33.2.11 show nat 1to1nat logtrap

Display the Log/Trap settings for 1:1 NAT rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat 1to1nat logtrap [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | 1:1 NAT rule number |

### 33.2.12 show nat doublenat global

Display the summary.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat doublenat global`

### 33.2.13 show nat doublenat rules

Display the Double NAT rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat doublenat rules [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Double NAT rule number |

### 33.2.14 show nat doublenat logtrap

Display the Log/Trap settings for the Double NAT rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat doublenat logtrap [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Double NAT rule number |

### 33.2.15 show nat doublenat if

Display the Double NAT interface configuration.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat doublenat if`

### 33.2.16 show nat nat64 rules

Display the NAT64 rules.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show nat nat64 rules [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | NAT64 rule number |

# 34 Neighbor Discovery Protocol (IP NDP)

## 34.1 ipv6

Set IPv6 parameters.

### 34.1.1 ipv6 ndp add

Add a static ndp entry.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 ndp add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-2` | aa:bb:cc:dd:ee:ff | `MAC address.` |

### 34.1.2 ipv6 ndp delete

Delete a static ndp entry.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 ndp delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |

### 34.1.3 ipv6 ndp enable

Enable a static ndp entry.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 ndp enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |

### 34.1.4 ipv6 ndp disable

Disable a static ndp entry.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 ndp disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |

## 34.2 show

Display device options and settings.

### 34.2.1 show ipv6 ndp table

Display the NDP cache entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 ndp table`

### 34.2.2 show ipv6 ndp static

Display the static NDP entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 ndp static`

### 34.2.3 show ipv6 ndp entry

Display the NDP cache entry.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 ndp entry <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |

## 34.3 clear

Clear several items.

### 34.3.1 clear ipv6 ndp-cache

Clear the router's NDP table (cache).

- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `clear ipv6 ndp-cache`

# 35 Network Time Protocol (NTP)

## 35.1 ntp

Configure NTP settings.

### 35.1.1 ntp client operation

Enable or disable the NTP client.

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

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

### 35.1.2 ntp client operating-mode

Set the NTP client operating mode.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | unicast | Enable NTP client in unicast operating mode. |
| | broadcast | Enable NTP client in broadcast operating mode. |

### 35.1.3 ntp server operation

Enable or disable the NTP server.

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

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

### 35.1.4 ntp server operating-mode

Set the NTP server operating mode.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | symmetric | Enable NTP server in symmetric operating mode. |
| | client-server | Enable NTP server in client-server operating mode. |

### 35.1.5 ntp server localclock-stratum

Set the stratum of the localclock.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..16 | Localclock stratum. |

### 35.1.6 ntp peers add

Add a new peer.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ntp peers add <P-1> ip <P-2> [iburst <P-3>] [burst <P-4>] [prefer <P-5>]`

`ip`: Set the peer address.
`[iburst]`: Speed up the initial synchronization (default: disabled). Used only when operating in client-unicast mode.

[burst]: Increase the precision on links with high jitter (default: disabled). Used only in client-unicast mode.
[prefer]: If correctly operating, choose this peer as synchronization source (default: disabled).

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | NTP servers index. |
| P-2 | A.B.C.D | IP address. |
| P-3 | enable | Enable the option. |
| | disable | Disable the option. |
| P-4 | enable | Enable the option. |
| | disable | Disable the option. |
| P-5 | enable | Enable the option. |
| | disable | Disable the option. |

### 35.1.7 ntp peers delete

Delete a peer.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | NTP servers index. |

## 35.2 show

Display device options and settings.

### 35.2.1 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

### 35.2.2 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

# 36 Packet Filter

## 36.1 packet-filter

Creation and configuration of Firewall rules.

### 36.1.1 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`

### 36.1.2 packet-filter l3 defaultpolicy

Sets the default policy of the L3 and DynFw rule tables
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 defaultpolicy <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | accept | `Accept packets` |
| | drop | `Drop packets without notification` |
| | reject | `Drop packets and notify source` |

### 36.1.3 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`

### 36.1.4 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> protocol-name <P-8> [description <P-9>] [profile-index <P-10>`

`protocol-name`: Protocol Name
`[description]`: Rule description/name for the L3 firewall rule
`[profile-index]`: Profile index of the DPI profile this rule is assigned to depending on enforcer action. Value 0 no profile this rule is assigned to. You cannot assign the rule to an inactive profile if an active enforcer will mapping to it.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..2048 | `Rule index` |
| `P-2` | string | `Source IP address/CIDR mask/'any'/asset name from asset table` |
| `P-3` | string | `Source port/port list with comma/port range with hyphen/'any'` |
| `P-4` | string | `Target IP address/CIDR mask/'any'/asset name from asset table` |
| `P-5` | string | `Target port/port list with comma/port range with hyphen/'any'` |
| `P-6` | string | `Parameters for rule (or 'none')` |

| Parameter | Value | Meaning |
|---|---|---|
| P-7 | accept | Accept packets. |
| | drop | Drop packets without notification. |
| | reject | Drop packets and notify source. |
| | enforce-modbus | Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP. |
| | enforce-opc | Accept or drop packets by OPC enforcer, protocol should be TCP. |
| | enforce-iec104 | Accept or drop packets by IEC104 enforcer, protocol should be TCP. |
| | enforce-ethernetip | Accept or drop packets by ENIP enforcer, protocol should be TCP. |
| | enforce-dnp3 | Accept or drop packets by DNP3 enforcer, protocol should be TCP. |
| | enforce-s7 | Accept or drop packets by S7 enforcer, protocol should be TCP. |
| P-8 | string | Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any |
| P-9 | string | Rule description/name |
| P-10 | 0..32 | Profile index 0 - 32 |

### 36.1.5 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> protocol-name <P-8> [description <P-9>] [profile-index <P-10>`

`protocol-name`: Protocol Name
`[description]`: Rule description/name for the L3 firewall rule
`[profile-index]`: Profile index of the DPI profile this rule is assigned to depending on enforcer action. Value 0 no profile this rule is assigned to. You cannot assign the rule to an inactive profile if an active enforcer will mapping to it.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |
| P-2 | string | Source IP address/CIDR mask/'any'/asset name from asset table |
| P-3 | string | Source port/port list with comma/port range with hyphen/'any' |
| P-4 | string | Target IP address/CIDR mask/'any'/asset name from asset table |
| P-5 | string | Target port/port list with comma/port range with hyphen/'any' |
| P-6 | string | Parameters for rule (or 'none') |
| P-7 | accept | Accept packets. |
| | drop | Drop packets without notification. |
| | reject | Drop packets and notify source. |
| | enforce-modbus | Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP. |
| | enforce-opc | Accept or drop packets by OPC enforcer, protocol should be TCP. |
| | enforce-iec104 | Accept or drop packets by IEC104 enforcer, protocol should be TCP. |
| | enforce-ethernetip | Accept or drop packets by ENIP enforcer, protocol should be TCP. |
| | enforce-dnp3 | Accept or drop packets by DNP3 enforcer, protocol should be TCP. |
| | enforce-s7 | Accept or drop packets by S7 enforcer, protocol should be TCP. |
| P-8 | string | Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any |
| P-9 | string | Rule description/name |
| P-10 | 0..32 | Profile index 0 - 32 |

### 36.1.6 packet-filter l3 delrule

Deletes a rule from L3 rule table

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.7 packet-filter l3 enablerule

Enables a rule from L3 rule table. A rule can only be enabled when all the required parameters are set. You cannot enable a rule if the mapped enforcer's profile is inactive.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.8 packet-filter l3 disablerule

Disables a rule from L3 rule table

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.9 packet-filter l3 logmode

Set logmode for a rule from L3 rule table

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 logmode <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |
| P-2 | log | Log when rule is applied |
| | trap | Send trap when rule is applied |
| | logtrap | Log and send trap when rule is applied |
| | none | Disable log and trap |

### 36.1.10 packet-filter l3 addif

Adds an interface to a L3 firewall rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 addif <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| | both | Rule applies in ingress and egress direction. |
| P-3 | 1..2048 | Rule index |
| P-4 | 0..4294967295 | Priority |

### 36.1.11 packet-filter l3 delif

Deletes an interface of a L3 firewall rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 delif <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| | both | Rule applies in ingress and egress direction. |
| P-3 | 1..2048 | Rule index |

### 36.1.12 packet-filter l3 enableif

Enables an interface of a L3 firewall rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 enableif <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| | both | Rule applies in ingress and egress direction. |
| P-3 | 1..2048 | Rule index |

### 36.1.13 packet-filter l3 disableif

Disables an interface of a L3 firewall rule

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l3 disableif <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-3` | ingress | `Rule applies on ingress direction.` |
| | egress | `Rule applies on egress direction.` |
| | both | `Rule applies in ingress and egress direction.` |
| `P-3` | 1..2048 | `Rule index` |

### 36.1.14 packet-filter l2 commit

Writes all changes made in the L2 firewall configuration to the device

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 commit`

### 36.1.15 packet-filter l2 defaultpolicy

Sets the default policy of the L2 rule tables.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 defaultpolicy <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | accept | `Accept packets.` |
| | drop | `Drop packets without notification.` |

### 36.1.16 packet-filter l2 fcs-validation

Activates/Deactivates FCS validation

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 fcs-validation <P-1>`

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

### 36.1.17 packet-filter l2 rule add

Adds a rule to the L2 firewall table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 rule add <P-1> action <P-2> [src-mac <P-3>] [dst-mac <P-4>] [src-ip <P-5>] [sourceport <P-6>] [dest-ip <P-7>] [destport <P-8>] [ethertype <P-9>] [proto <P-10>] [vlan <P-11>] [assign-queue <P-12>] [description <P-13>] [profile-index <P-14>] [rate-limit <P-15> <P-16> <P-17>] [tos <P-18>] [log <P-19>] [trap <P-20>]`

`action`: Set Action
`[src-mac]`: Specify the source MAC address/'any'/asset name from the asset table.
`[dst-mac]`: Specify the destination MAC address/'any'/asset name from the asset table.
`[src-ip]`: Specify the source IP address/CIDR mask/'any'/asset name from the asset table.
`[sourceport]`: Specify the source L4 port.
`[dest-ip]`: Specify the destination IP address/CIDR mask/'any'/asset name from the asset table.
`[destport]`: Specify the destination L4 port.
`[ethertype]`: Specify the Ethertype.
`[proto]`: Specify the protocol for the L2 firewall rule/user-defined protocol from the protocol table.
`[vlan]`: Specify the VLAN ID for L2 firewall rule.
`[assign-queue]`: Assign a user Queue.
`[description]`: Rule description/name for the L2 firewall rule.
`[profile-index]`: Profile index of the DPI profile this rule is assigned to depending on enforcer action. Value 0 no profile this rule is assigned to. You cannot assign the rule to an inactive profile if an active enforcer is mapped to it.
`[rate-limit]`: Specify the rate limit and burst size.

[tos]: Specify TOS for L2 rule.
[log]: Set logging.
[trap]: Set sending SNMP traps.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |
| P-2 | accept | Accept packets. |
| | drop | Drop packets without notification. |
| | enforce-modbus | Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP. |
| | enforce-opc | Accept or drop packets by OPC enforcer, protocol should be TCP. |
| | enforce-iec104 | Accept or drop packets by IEC104 enforcer, protocol should be TCP. |
| | enforce-ethernetip | Accept or drop packets by ENIP enforcer, protocol should be TCP. |
| | enforce-dnp3 | Accept or drop packets by DNP3 enforcer, protocol should be TCP. |
| | enforce-amp | Accept or drop packets by AMP enforcer, protocol should be TCP. |
| | enforce-goose | Accept or drop packets by Goose enforcer, protocol should be TCP. |
| | enforce-s7 | Accept or drop packets by S7 enforcer, protocol should be TCP. |
| P-3 | string | Source MAC address/'any'/asset name from the asset table |
| P-4 | string | Target MAC address/'any'/asset name from the asset table |
| P-5 | string | Source IP address/CIDR mask/'any'/asset name from asset table |
| P-6 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |
| P-7 | string | Target IP address/CIDR mask/'any'/asset name from asset table |
| P-8 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |
| P-9 | value | Ethertype |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBMSNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX-OLD |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | NOVELL |
| | pppoedisc | PPPOEDISC |
| | rarp | RARP |
| | pppoesess | PPPOESESS |
| | ipxnew | IPXNEW |
| | profinet | PROFINET |
| | powerlink | POWERLINK |
| | ethercat | ETHERCAT |
| | vlan8021q | IEEE802_1Q VLAN |
| | goose | GOOSE |
| P-10 | string | Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any |
| P-11 | 1..4042 | Enter a VLAN ID in the given range. |
| P-12 | 0..7 | Enter a Queue ID in the given range. |
| P-13 | string | Rule description/name |
| P-14 | 0..32 | Profile index 0 - 32 |
| P-15 | 0..10000000 | Committed rate value, specified in kbps or pps. |
| P-16 | 0..128 | Committed burst size value, specified in kbytes or pps. |
| P-17 | pps | Packets per second. |
| | kbps | kbytes per second. |
| P-18 | 0..255 | Specify the IP TOS bits to match. |
| P-19 | enable | Enable logging when applying the rule |
| | disable | Do not log applying the rule |
| P-20 | enable | Enable sending a trap when applying the rule |
| | disable | Do not send a trap when applying the rule |

- **no packet-filter l2 rule add**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no packet-filter l2 rule add action [src-mac] [dst-mac] [src-ip] [sourceport] [dest-ip] [destport] [ethertype] [proto] [vlan] [assign-queue] [description] [profile-index] [rate-limit] [tos] [log <P-19>] [trap <P-20>]`

### 36.1.18 packet-filter l2 rule modify

Modifies a rule to the L2 firewall table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 rule modify <P-1> [action <P-2>] [src-mac <P-3>] [dst-mac <P-4>] [src-ip <P-5>] [sourceport <P-6>] [dest-ip <P-7>] [destport <P-8>] [ethertype <P-9>] [proto <P-10>] [vlan <P-11>] [assign-queue <P-12>] [description <P-13>] [profile-index <P-14>] [rate-limit <P-15> <P-16> <P-17>] [tos <P-18>] [log <P-19>] [trap <P-20>]`

`[action]`: Set Action
`[src-mac]`: Specify the source MAC address/'any'/asset name from the asset table.
`[dst-mac]`: Specify the destination MAC address/'any'/asset name from the asset table.
`[src-ip]`: Specify the source IP address/CIDR mask/'any'/asset name from the asset table.
`[sourceport]`: Specify the source L4 port.
`[dest-ip]`: Specify the destination IP address/CIDR mask/'any'/asset name from the asset table.
`[destport]`: Specify the destination L4 port.
`[ethertype]`: Specify the Ethertype.
`[proto]`: Specify the protocol for the L2 firewall rule/user-defined protocol from the protocol table.
`[vlan]`: Specify the VLAN ID for L2 firewall rule.
`[assign-queue]`: Assign a user Queue.
`[description]`: Rule description/name for L2 firewall rule.
`[profile-index]`: Profile index of the DPI profile this rule is assigned to depending on enforcer action. Value 0 no profile this rule is assigned to. You cannot assign the rule to an inactive profile if an active enforcer will mapping to it.
`[rate-limit]`: Specify the rate limit and burst size.
`[tos]`: Specify TOS for L2 rule.
`[log]`: Set logging.
`[trap]`: Set sending SNMP traps.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |
| P-2 | accept | Accept packets. |
| | drop | Drop packets without notification. |
| | enforce-modbus | Accept or drop packets by Modbus TCP/IP enforcer, protocol should be TCP or UDP. |
| | enforce-opc | Accept or drop packets by OPC enforcer, protocol should be TCP. |
| | enforce-iec104 | Accept or drop packets by IEC104 enforcer, protocol should be TCP. |
| | enforce-ethernetip | Accept or drop packets by ENIP enforcer, protocol should be TCP. |
| | enforce-dnp3 | Accept or drop packets by DNP3 enforcer, protocol should be TCP. |
| | enforce-amp | Accept or drop packets by AMP enforcer, protocol should be TCP. |
| | enforce-goose | Accept or drop packets by Goose enforcer, protocol should be TCP. |
| | enforce-s7 | Accept or drop packets by S7 enforcer, protocol should be TCP. |
| P-3 | string | Source MAC address/'any'/asset name from the asset table |
| P-4 | string | Target MAC address/'any'/asset name from the asset table |
| P-5 | string | Source IP address/CIDR mask/'any'/asset name from asset table |
| P-6 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |
| P-7 | string | Target IP address/CIDR mask/'any'/asset name from asset table |
| P-8 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |

| Parameter | Value | Meaning |
|---|---|---|
| P-9 | value | Ethertype |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBMSNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX-OLD |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | NOVELL |
| | pppoedisc | PPPOEDISC |
| | rarp | RARP |
| | pppoesess | PPPOESESS |
| | ipxnew | IPXNEW |
| | profinet | PROFINET |
| | powerlink | POWERLINK |
| | ethercat | ETHERCAT |
| | vlan8021q | IEEE802_1Q VLAN |
| | goose | GOOSE |
| P-10 | string | Protocol Name from protocol table or tcp/udp/icmp/igmp/ipip/esp/ah/icmpv6/any |
| P-11 | 1..4042 | Enter a VLAN ID in the given range |
| P-12 | 0..7 | Enter a Queue ID in the given range. |
| P-13 | string | Rule description/name |
| P-14 | 0..32 | Profile index 0 - 32 |
| P-15 | 0..10000000 | Committed rate value, specified in kbps or pps. |
| P-16 | 0..128 | Committed burst size value, specified in kbytes or pps. |
| P-17 | pps | Packets per second. |
| | kbps | kbytes per second. |
| P-18 | 0..255 | Specify the IP TOS bits to match. |
| P-19 | enable | Enable logging when applying the rule |
| | disable | Do not log applying the rule |
| P-20 | enable | Enable sending a trap when applying the rule |
| | disable | Do not send a trap when applying the rule |

- **no packet-filter l2 rule modify**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no packet-filter l2 rule modify [action] [src-mac] [dst-mac] [src-ip] [sourceport] [dest-ip] [destport] [ethertype] [proto] [vlan] [assign-queue] [description] [profile-index] [rate-limit] [tos] [log <P-19>] [trap <P-20>]`

### 36.1.19 packet-filter l2 rule delete

Deletes a rule from L2 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 rule delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.20 packet-filter l2 rule enable

Enables a rule from L2 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 rule enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.21 packet-filter l2 rule disable

Disables a rule from L2 rule table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 rule disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..2048 | Rule index |

### 36.1.22 packet-filter l2 if add

Adds an interface to a L2 firewall rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 if add <P-1> <P-2> <P-3> <P-4> <P-5>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | port | Interface type to use is physical interface. |
| | vlan | Interface type to use is L2 VLAN. |
| P-2 | 1..4042 | Interface ID for rule assignment. |
| P-3 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| P-4 | 1..2048 | Rule index |
| P-5 | 0..4294967295 | Priority |

### 36.1.23 packet-filter l2 if delete

Deletes an interface of a L2 firewall rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 if delete <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | port | Interface type to use is physical interface. |
| | vlan | Interface type to use is L2 VLAN. |
| P-2 | 1..4042 | Interface ID for rule assignment. |
| P-3 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| P-4 | 1..2048 | Rule index |

### 36.1.24 packet-filter l2 if enable

Enables an interface of a L2 firewall rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 if enable <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | port | Interface type to use is physical interface. |
| | vlan | Interface type to use is L2 VLAN. |
| P-2 | 1..4042 | Interface ID for rule assignment. |
| P-3 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| P-4 | 1..2048 | Rule index |

### 36.1.25 packet-filter l2 if disable

Disables an interface of a L2 firewall rule.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `packet-filter l2 if disable <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | port | Interface type to use is physical interface. |
| | vlan | Interface type to use is L2 VLAN. |
| P-2 | 1..4042 | Interface ID for rule assignment. |
| P-3 | ingress | Rule applies on ingress direction. |
| | egress | Rule applies on egress direction. |
| P-4 | 1..2048 | Rule index |

## 36.2 clear

Clear several items.

### 36.2.1 clear fw-state-table

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

## 36.3 show

Display device options and settings.

### 36.3.1 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`

### 36.3.2 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`

### 36.3.3 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`

### 36.3.4 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`

### 36.3.5 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`

### 36.3.6 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`

### 36.3.7 show packet-filter l2 global

Display the packet-filter global information and settings.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show packet-filter l2 global`

### 36.3.8 show packet-filter l2 rule

Display the L2 rule table.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show packet-filter l2 rule`

### 36.3.9 show packet-filter l2 if

Display the L2 interface mapping table.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show packet-filter l2 if`

# 37 Protocol

## 37.1 protocol

Protocol configuration.

### 37.1.1 protocol add

Add a Protocol configuration to the protocol table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `protocol add <P-1> name <P-2> [description <P-3>] [protocol-type <P-4>] [ethertype <P-5>] [proto-number <P-6>] [port <P-7>]`

`name`: Specify the Protocol Name
`[description]`: Specify the Protocol Description
`[protocol-type]`: Specify the Protocol Type
`[ethertype]`: Specify the ethernet type
`[proto-number]`: Specify the Protocol number
`[port]`: Specify the Port

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Protocol Index |
| P-2 | string | Protocol Name |
| P-3 | string | Protocol Description |
| P-4 | any | any protocol |
| | ethernet | ethernet protocol |
| | icmp | internet control message protocol |
| | tcp | transmission control protocol |
| | udp | user datagram protocol |
| P-5 | value | Ethertype |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBMSNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX-OLD |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | NOVELL |
| | pppoedisc | PPPOEDISC |
| | rarp | RARP |
| | pppoesess | PPPOESESS |
| | ipxnew | IPXNEW |
| | profinet | PROFINET |
| | powerlink | POWERLINK |
| | ethercat | ETHERCAT |
| | vlan8021q | IEEE802_1Q VLAN |
| P-6 | 0..255. | Protocol Number |
| P-7 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |

### 37.1.2 protocol modify

Modifies a protocol configuration present in the protocol table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `protocol modify <P-1> [name <P-2>] [description <P-3>] [protocol-type <P-4>] [ethertype <P-5>] [proto-number <P-6>] [port <P-7>]`

`[name]`: Specify the Protocol Name

[description]: Specify the Protocol Description
[protocol-type]: Specify the Protocol Type
[ethertype]: Specify the ethernet type
[proto-number]: Specify the Protocol Number
[port]: Specify the Port

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Protocol Index |
| P-2 | string | Protocol Name |
| P-3 | string | Protocol Description |
| P-4 | any | any protocol |
| | ethernet | ethernet protocol |
| | icmp | internet control message protocol |
| | tcp | transmission control protocol |
| | udp | user datagram protocol |
| P-5 | value | Ethertype |
| | appletalk | Appletalk |
| | arp | ARP |
| | ibmsna | IBMSNA |
| | ipv4 | IPv4 |
| | ipv6 | IPv6 |
| | ipx-old | IPX-OLD |
| | mplsmcast | MPLS Multicast |
| | mplsucast | MPLS Unicast |
| | netbios | NetBIOS |
| | novell | NOVELL |
| | pppoedisc | PPPOEDISC |
| | rarp | RARP |
| | pppoesess | PPPOESESS |
| | ipxnew | IPXNEW |
| | profinet | PROFINET |
| | powerlink | POWERLINK |
| | ethercat | ETHERCAT |
| | vlan8021q | IEEE802_1Q VLAN |
| P-6 | 0..255 | Protocol Number |
| P-7 | any | Any port/portless protocol |
| | a-b | Port Range |
| | a,b | Port List (may be longer than two ports) |
| | a-b, c-d | List of Port Ranges (may be longer than two ranges) |
| | 1 to 65535 | Port Number |

### 37.1.3 protocol delete

Delete a protocol configurtion present in the protocol table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: protocol delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..50 | Protocol Index |

## 37.2 show

Display device options and settings.

### 37.2.1 show protocol list

Display all configured protocol list

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

# 38 Port Monitor

## 38.1 link-flap

Configure the link flap settings.

### 38.1.1 link-flap operation

Enable or disable the link flap.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `link-flap operation`

- **no link-flap operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no link-flap operation`

## 38.2 show

Display device options and settings.

### 38.2.1 show link-flap operation

Display the link flap operation.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show link-flap operation`

# 39 Password Management

## 39.1 passwords

Manage password policies and options.

### 39.1.1 passwords min-length

Set minimum password length for user passwords.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords min-length <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..64 | Enter a number in the given range. |

### 39.1.2 passwords max-login-attempts

Set maximum login attempts for the users.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords max-login-attempts <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..5 | Enter a number in the given range. |

### 39.1.3 passwords min-uppercase-chars

Set minimum upper case characters for user passwords.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords min-uppercase-chars <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..16 | Enter a number in the given range. |

### 39.1.4 passwords min-lowercase-chars

Set minimum lower case characters for user passwords.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords min-lowercase-chars <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..16 | Enter a number in the given range. |

### 39.1.5 passwords min-numeric-chars

Set minimum numeric characters for user passwords.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords min-numeric-chars <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..16 | Enter a number in the given range. |

### 39.1.6 passwords min-special-chars

Set minimum special characters for user passwords.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords min-special-chars <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..16 | Enter a number in the given range. |

### 39.1.7 passwords login-attempt-period

The time period [minutes] in which the number of failed authentication attempts is counted. Value 0 disables this functionality.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords login-attempt-period <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0 | Disables the counting. |
| | 1..60 | Enter a number in the given range. |

### 39.1.8 passwords auto-unlock-users

Enable or disable automatic unlocking of user accounts.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `passwords auto-unlock-users <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | enabled | |
| | disabled | |

- **no passwords auto-unlock-users**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no passwords auto-unlock-users <P-1>`

## 39.2 show

Display device options and settings.

### 39.2.1 show passwords

Display the password policies and options.

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

# 40 Radius

## 40.1 radius

Configure RADIUS parameters.

### 40.1.1 radius server attribute 4

Specifies the RADIUS client to use the NAS-IP Address attribute in the RADIUS requests.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `radius server attribute 4 <P-1>`

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

### 40.1.2 radius server auth add

Add a RADIUS authentication server.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `radius server auth add <P-1> ip <P-2> [name <P-3>] [port <P-4>]`

`ip`: RADIUS authentication server IP address.
`[name]`: RADIUS authentication server name.
`[port]`: RADIUS authentication server port (default: 1812).

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..8 | `Next RADIUS server valid index (it can be seen with '#show radius global' command).` |
| `P-2` | string | Hostname or IP address. |
| `P-3` | string | `Enter a user-defined text, max. 32 characters.` |
| `P-4` | 1..65535 | `Enter port number between 1 and 65535` |

### 40.1.3 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.` |

### 40.1.4 radius server auth modify

Change a RADIUS authentication server parameters.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `radius server auth modify <P-1> [name <P-2>] [port <P-3>] [msgauth <P-4>] [primary <P-5>] [status <P-6>] [secret [<P-7>]] [encrypted <P-8>]`

`[name]`: RADIUS authentication server name.
`[port]`: RADIUS authentication server port (default: 1812).
`[msgauth]`: Enable or disable the message authenticator attribute for this server.
`[primary]`: Configure the primary RADIUS server.
`[status]`: Enable or disable a RADIUS authentication server entry.
`[secret]`: Configure the shared secret for the RADIUS authentication server.
`[encrypted]`: Configure the encrypted shared secret.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..8 | `RADIUS server index.` |
| `P-2` | string | `Enter a user-defined text, max. 32 characters.` |
| `P-3` | 1..65535 | `Enter port number between 1 and 65535` |
| `P-4` | enable | `Enable the option.` |
| | disable | `Disable the option.` |
| `P-5` | enable | `Enable the option.` |
| | disable | `Disable the option.` |

| Parameter | Value | Meaning |
|---|---|---|
| P-6 | enable | Enable the option. |
| | disable | Disable the option. |
| P-7 | string | Enter a user-defined text, max. 128 characters. |
| P-8 | string | Enter a user-defined text, max. 128 characters. |

### 40.1.5 radius server retransmit

Configure the retransmit value for the RADIUS server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server retransmit <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..15 | Maximum number of retransmissions (default: 4). |

### 40.1.6 radius server timeout

Configure the RADIUS server timeout value.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: radius server timeout <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..30 | Timeout in seconds (default: 5). |

## 40.2 show

Display device options and settings.

### 40.2.1 show radius global

Display the global RADIUS configuration.

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

### 40.2.2 show radius auth servers

Display the configured RADIUS authentication servers.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show radius auth servers [<P-1>]

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | RADIUS server index. |

### 40.2.3 show radius auth statistics

Display the RADIUS authentication server statistics.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show radius auth statistics <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | RADIUS server index. |

## 40.3 clear

Clear several items.

### 40.3.1 clear radius

Clear the RADIUS statistics.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `clear radius <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | statistics | Clear the RADIUS statistics. |

# 41 Remote Authentication

## 41.1 ldap

Configure LDAP settings.

### 41.1.1 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`

### 41.1.2 ldap cache-timeout

Configure LDAP user cache entry timeout.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap cache-timeout <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..1440 | Enter a number in the given range. |

### 41.1.3 ldap flush-user-cache

Flush LDAP user cache.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap flush-user-cache <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | action | Flush the LDAP user cache. |

### 41.1.4 ldap role-policy

Configure LDAP user role selection policy.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap role-policy <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | highest | Use the role mapping with the highest user role. |
| | first | Use the first matching role mapping table entry. |

### 41.1.5 ldap basedn

Base distinguished name for LDAP query at the external AD server.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap basedn <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 255 characters. |

### 41.1.6 ldap search-attr

Search attribute for LDAP query at the external AD server.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap search-attr <P-1>`

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

### 41.1.7 ldap bind-user

Bind-account user name for LDAP query at the external AD server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap bind-user <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 255 characters. |

### 41.1.8 ldap bind-passwd

Bind-account user password for LDAP query at the external AD server.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap bind-passwd <P-1>

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

### 41.1.9 ldap default-domain

Default domain used for users without a domain name.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap default-domain <P-1>

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

### 41.1.10 ldap client server add

Add a LDAP client server connection.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap client server add <P-1> <P-2> [port <P-3>] [security <P-4>] [description <P-5>]

[port]: Set the port number of the external LDAP server.
[security]: Set the security settings for the connection to external LDAP server.
[description]: Description of the external LDAP server.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | Enter a number in the given range. |
| P-2 | a.b.c.d | IP address. |
| P-3 | 1..65535 | Port number of LDAP Server. |
| P-4 | none | |
| | ssl | |
| | startTLS | |
| P-5 | string | Enter a user-defined text, max. 100 characters. |

### 41.1.11 ldap client server delete

Delete a LDAP client server connection.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap client server delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | Enter a number in the given range. |

### 41.1.12 ldap client server enable

Enable a LDAP client server connection.

- Mode: Global Config Mode
- Privilege Level: Administrator
- Format: ldap client server enable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | Enter a number in the given range. |

### 41.1.13 ldap client server disable

Disable a LDAP client server connection.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap client server disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..4 | `Enter a number in the given range.` |

### 41.1.14 ldap client server modify

Modify a LDAP client server connection.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap client server modify <P-1> [addr <P-2>] [port <P-3>] [security <P-4>] [description <P-5>]`

`[addr]`: Modify the host address of the external LDAP server.
`[port]`: Modify the port number of the external LDAP server.
`[security]`: Modify the security settings for the connection to external LDAP server.
`[description]`: Modify the description of the external LDAP server.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..4 | `Enter a number in the given range.` |
| `P-2` | a.b.c.d | IP address. |
| `P-3` | 1..65535 | `Port number of LDAP Server.` |
| `P-4` | none | |
| | ssl | |
| | startTLS | |
| `P-5` | string | `Enter a user-defined text, max. 100 characters.` |

### 41.1.15 ldap mapping add

Add a LDAP mapping entry.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap mapping add <P-1> access-role <P-2> mapping-type <P-3> mapping-parameter <P-4>`

`access-role`: Access role type.
`mapping-type`: Role mapping type.
`mapping-parameter`: Role mapping parameter.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..64 | `Enter a number in the given range.` |
| `P-2` | slot no./port no. | |
| `P-3` | attribute | |
| | group | |
| `P-4` | string | `Enter a user-defined text, max. 255 characters.` |

### 41.1.16 ldap mapping delete

Delete a LDAP role mapping entry.

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..64 | `Enter a number in the given range.` |

### 41.1.17 ldap mapping enable

Activate a LDAP role mapping entry.

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

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..64 | `Enter a number in the given range.` |

### 41.1.18 ldap mapping disable

Deactivate a LDAP role mapping entry.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ldap mapping disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..64 | Enter a number in the given range. |

## 41.2 show

Display device options and settings.

### 41.2.1 show ldap global

Display the LDAP configuration parameters and information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show ldap global`

### 41.2.2 show ldap client server

Display the LDAP client server connections.
- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show ldap client server [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4 | Enter a number in the given range. |

### 41.2.3 show ldap mapping

Display the LDAP role mapping entries.
- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show ldap mapping [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..64 | Enter a number in the given range. |

## 41.3 copy

Copy different kinds of items.

### 41.3.1 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>]`

`nvm`: Copy CA certificate file (*.pem) from the remote AD server to the device.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 128 characters. |
| P-2 | string | Enter a user-defined text, max. 100 characters. |

### 41.3.2 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.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 128 characters. |
| P-2 | string | Enter a user-defined text, max. 100 characters. |

# 42 Remote Monitoring (RMON)

## 42.1 show

Display device options and settings.

### 42.1.1 show rmon statistics

Show RMON statistics configuration.

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

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

# 43 Script File

## 43.1 script

CLI Script File.

### 43.1.1 script apply

Executes the CLI script file available in the device.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `script apply <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

### 43.1.2 script validate

Only validates the CLI script file available in the device.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `script validate <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

### 43.1.3 script list system

List all the script files available in the device memory.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `script list system`

### 43.1.4 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`

### 43.1.5 script delete

Delete the CLI script files.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `script delete [<P-1>]`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

## 43.2 copy

Copy different kinds of items.

### 43.2.1 copy script envm

Copy script file from external non-volatile memory to specified destination.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Administrator`
- Format: `copy script envm <P-1> running-config nvm <P-2>`

`running-config`: Copy script file from external non-volatile memory to the running-config.
`nvm`: Copy script file from external non-volatile memory to the non-volatile memory.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

| Parameter | Value | Meaning |
|---|---|---|
| P-2 | string | Enter a user-defined text, max. 32 characters. |

### 43.2.2 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 nvm <P-2>

running-config: Copy script file from file server to running-config.
nvm: Copy script file to non-volatile memory.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 128 characters. |
| P-2 | string | Enter a user-defined text, max. 32 characters. |

### 43.2.3 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>

running-config: Copy Script file from non-volatile system memory to running-config.
envm: Copy Script file to external non-volatile memory device.
remote: Copy Script file to file server.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Filename. |
| P-2 | string | Enter a user-defined text, max. 32 characters. |
| P-3 | string | Enter a user-defined text, max. 128 characters. |

### 43.2.4 copy script running-config nvm

Copy running configuration to non-volatile memory.
- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy script running-config nvm <P-1> [all]

[all]: Copy all running configuration to non-volatile memory.

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

### 43.2.5 copy script running-config envm

Copy running configuration to external non-volatile memory device.
- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy script running-config envm <P-1> [all]

[all]: Copy all running configuration to external non-volatile memory.

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

### 43.2.6 copy script running-config remote

Copy running configuration to a file server.
- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy script running-config remote <P-1> [all] [source-interface <P-2>]

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

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

## 43.3 show

Display device options and settings.

### 43.3.1 show script envm

Display the content of the CLI script file present in the envm.

- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show script envm <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

### 43.3.2 show script system

Display the content of the CLI script file present in the device.

- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show script system <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | Filename. |

# 44 Selftest

## 44.1 selftest

Configure the selftest settings.

### 44.1.1 selftest action

Configure the action that a selftest component should take.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `selftest action <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | task | `Configure the action for task errors.` |
| | resource | `Configure the action for lack of resources.` |
| | software | `Configure the action for broken software integrity.` |
| | hardware | `Configure the action for detected hardware errors.` |
| `P-2` | log-only | `Write a message to the logging file.` |
| | send-trap | `Send a trap to the management station.` |
| | reboot | `Reboot the device.` |

### 44.1.2 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`

### 44.1.3 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`

### 44.1.4 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`

## 44.2 show

Display device options and settings.

### 44.2.1 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`

### 44.2.2 show selftest settings

Display the selftest settings.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show selftest settings`

# 45 Small Form-factor Pluggable (SFP)

## 45.1 show

Display device options and settings.

### 45.1.1 show sfp

Display the information about the plugged SFP modules.

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

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

# 46 Signal Contact

## 46.1 signal-contact

Configure the signal contact settings.

### 46.1.1 signal-contact mode

Configure the Signal Contact mode setting.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> mode <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |
| `P-2` | manual | `The signal contact's status is determined by the associated manual setting (subcommand 'state').` |
| | monitor | `The signal contact's status is determined by the associated monitor settings.` |
| | device-status | `The signal contact's status is determined by the device status.` |
| | security-status | `The signal contact's status is determined by the security status.` |
| | dev-sec-status | `The signal contact's status is determined by the device status and security status.` |

### 46.1.2 signal-contact monitor link-failure

Sets the monitoring of the network connection(s).

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> monitor link-failure`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

**no signal-contact monitor link-failure**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no signal-contact <P-1> monitor link-failure`

### 46.1.3 signal-contact monitor envm-not-in-sync

Sets the monitoring whether the external non-volatile memory device is in sync with the running configuration.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> monitor envm-not-in-sync`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

**no signal-contact monitor envm-not-in-sync**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no signal-contact <P-1> monitor envm-not-in-sync`

### 46.1.4 signal-contact monitor envm-removal

Sets the monitoring of the external non-volatile memory device removal.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> monitor envm-removal`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

- **no signal-contact monitor envm-removal**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no signal-contact <P-1> monitor envm-removal`

### 46.1.5 signal-contact monitor temperature

Sets the monitoring of the device temperature.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> monitor temperature`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

- **no signal-contact monitor temperature**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no signal-contact <P-1> monitor temperature`

### 46.1.6 signal-contact monitor power-supply

Sets the monitoring of the power supply(s).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> monitor power-supply <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |
| `P-2` | 1..2 | `Number of power supply.` |

- **no signal-contact monitor power-supply**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no signal-contact <P-1> monitor power-supply <P-2>`

### 46.1.7 signal-contact state

Configure the Signal Contact manual state (only takes immediate effect in manual mode).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> state <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |
| `P-2` | open | `Open the signal contact (only takes effect in the manual mode).` |
| | close | `Close the signal contact (only takes effect in the manual mode).` |

### 46.1.8 signal-contact trap

Configure if a trap is sent when the Signal Contact changes state (in monitor mode).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> trap`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

- **no signal-contact trap**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no signal-contact <P-1> trap`

## 46.2 signal-contact

Configure the signal contact interface settings.

### 46.2.1 signal-contact link-alarm

Configure the monitoring of the specific network ports.

- Mode: `Interface Range Mode`
- Privilege Level: `Administrator`
- Format: `signal-contact <P-1> link-alarm`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

**no signal-contact link-alarm**

Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Administrator`
- Format: `no signal-contact <P-1> link-alarm`

## 46.3 show

Display device options and settings.

### 46.3.1 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 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.
`events`: Display the occurred device status events.
`all`: Display the signal contact settings for the specified signal contact.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | signal contact no. | |

# 47 Simple Network Management Protocol (SNMP)

## 47.1 snmp

Configure of SNMP versions and traps.

### 47.1.1 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`

### 47.1.2 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`

### 47.1.3 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`

### 47.1.4 snmp access port

Configure the SNMP access port.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp access port <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..65535 | `Port number of the SNMP server (default: 161).` |

## 47.2 show

Display device options and settings.

### 47.2.1 show snmp access

Display the SNMP access configuration settings.

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

# 48 SNMP Community

## 48.1 snmp

Configure of SNMP versions and traps.

### 48.1.1 snmp community ro

SNMP v1/v2 read-only community.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp community ro`

### 48.1.2 snmp community rw

SNMP v1/v2 read-write community.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp community rw`

## 48.2 show

Display device options and settings.

### 48.2.1 show snmp community

Display the SNMP v1/2 community.
- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show snmp community`

# 49 SNMP Logging

## 49.1 logging

Logging configuration.

### 49.1.1 logging snmp-request get operation

Enable or disable logging of SNMP GET or SET requests.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging snmp-request get operation <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | enable | Enable logging of SNMP GET or SET requests. |
| | disable | Disable logging of SNMP GET or SET requests. |

**no logging snmp-request get operation**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no logging snmp-request get operation <P-1>`

### 49.1.2 logging snmp-request get severity

Define severity level.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging snmp-request get severity <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

### 49.1.3 logging snmp-request set operation

Enable or disable logging of SNMP GET or SET requests.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging snmp-request set operation <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | enable | Enable logging of SNMP GET or SET requests. |
| | disable | Disable logging of SNMP GET or SET requests. |

**no logging snmp-request set operation**

Disable the option

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `no logging snmp-request set operation <P-1>`

### 49.1.4 logging snmp-request set severity

Define severity level.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `logging snmp-request set severity <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | emergency | System is unusable. System failure has occurred. |
| | alert | Action must be taken immediately. Unrecoverable failure of a component. System failure likely. |
| | critical | Recoverable failure of a component that may lead to system failure. |
| | error | Error conditions. Recoverable failure of a component. |
| | warning | Minor failure, e.g. misconfiguration of a component. |
| | notice | Normal but significant conditions. |
| | informational | Informational messages. |
| | debug | Debug-level messages. |
| | 0 | Same as emergency |
| | 1 | Same as alert |
| | 2 | Same as critical |
| | 3 | Same as error |
| | 4 | Same as warning |
| | 5 | Same as notice |
| | 6 | Same as informational |
| | 7 | Same as debug |

## 49.2 show

Display device options and settings.

### 49.2.1 show logging snmp

Display the SNMP logging settings.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show logging snmp`

# 50 Secure Shell (SSH)

## 50.1 ssh

Set SSH parameters.

### 50.1.1 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`

### 50.1.2 ssh timeout

Set the SSH connection idle timeout in minutes (default: 5).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ssh timeout <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..160 | Idle timeout of a session in minutes (default: 5). |

### 50.1.3 ssh port

Set the SSH server port number (default: 22).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ssh port <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..65535 | Port number of the SSH server (default: 22). |

### 50.1.4 ssh max-sessions

Set the maximum number of concurrent SSH sessions (default: 5).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ssh max-sessions <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..5 | Maximum number of concurrent SSH sessions. |

### 50.1.5 ssh key rsa

Generate or delete RSA key
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ssh key rsa <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | generate | Generates the item |
| | delete | Deletes the item |

### 50.1.6 ssh key fingerprint-type

Configure fingerprint type
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ssh key fingerprint-type <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | md5 | Configure md5 fingerprint of the existing SSH host key |
| | sha256 | Configure sha256 fingerprint of the existing SSH host key. |

## 50.2 copy

Copy different kinds of items.

### 50.2.1 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

nvm: Copy the SSH key from a server to non-volatile memory.

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

### 50.2.2 copy sshkey envm

Copy the SSH key from external non-volatile memory to the specified destination.

- Mode: Privileged Exec Mode
- Privilege Level: Administrator
- Format: copy sshkey envm <P-1> nvm

nvm: Copy the SSH key from external non-volatile memory to non-volatile memory.

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

## 50.3 show

Display device options and settings.

### 50.3.1 show ssh

Display the SSH server and client information.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ssh

# 51 Static Multicast Routing

## 51.1 ip

Set IP parameters.

### 51.1.1 ip mcast operation

Enables or disables multicast routing globally on the device.
- 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`

### 51.1.2 ip static-mcast operation

Enables or disables static multicast routing globally on the device.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast operation`

**no ip static-mcast operation**
Disable the option
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `no ip static-mcast operation`

### 51.1.3 ip static-mcast mgroup add

Add a new static multicast group instance.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mgroup add <P-1> inbound <P-2> [source-address <P-3>] [source-mask <P-4>] group-address <P-5> [group-mask <P-6>]`

`inbound`: Configure inbound interface
`[source-address]`: Configure IPv4 source address
`[source-mask]`: Configure IPv4 source netmask
`group-address`: Configure IPv4 group address
`[group-mask]`: Configure IPv4 group netmask

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..256 | `Static multicast group ID in the given range.` |
| `P-2` | slot no./port no. | |
| `P-3` | A.B.C.D | `IPv4 address.` |
| `P-4` | 0..32 | `Prefix length netmask.` |
| `P-5` | A.B.C.D | `IPv4 address.` |
| `P-6` | 0..32 | `Prefix length netmask.` |

### 51.1.4 ip static-mcast mgroup modify

Modify a new static multicast group instance.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mgroup modify <P-1> inbound <P-2> [source-address <P-3>] [source-mask <P-4>] group-address <P-5> [group-mask <P-6>]`

`inbound`: Configure inbound interface
`[source-address]`: Configure IPv4 source address
`[source-mask]`: Configure IPv4 source netmask

group-address: Configure IPv4 group address
[group-mask]: Configure IPv4 group netmask

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast group ID in the given range. |
| P-2 | slot no./port no. | |
| P-3 | A.B.C.D | IPv4 address. |
| P-4 | 0..32 | Prefix length netmask. |
| P-5 | A.B.C.D | IPv4 address. |
| P-6 | 0..32 | Prefix length netmask. |

### 51.1.5 ip static-mcast mgroup delete

Delete an existing static multicast group instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip static-mcast mgroup delete <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast group ID in the given range. |

### 51.1.6 ip static-mcast mgroup enable

Enables a rule from static multicast group table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip static-mcast mgroup enable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast group ID in the given range. |

### 51.1.7 ip static-mcast mgroup disable

Disables a rule from static multicast group table.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip static-mcast mgroup disable <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast group ID in the given range. |

### 51.1.8 ip static-mcast mroute add

Add a new static multicast route instance.

- Mode: Global Config Mode
- Privilege Level: Operator
- Format: ip static-mcast mroute add <P-1> inbound <P-2> [source-address <P-3>] [source-mask <P-4>] group-address <P-5> [group-mask <P-6>] outbound <P-7>

inbound: Configure inbound interface
[source-address]: Configure IPv4 source address
[source-mask]: Configure IPv4 source netmask
group-address: Configure IPv4 group address
[group-mask]: Configure IPv4 group netmask
outbound: Configure outbound interface

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast route ID in the given range. |
| P-2 | slot no./port no. | |
| P-3 | A.B.C.D | IPv4 address. |
| P-4 | 0..32 | Prefix length netmask. |
| P-5 | A.B.C.D | IPv4 address. |
| P-6 | 0..32 | Prefix length netmask. |
| P-7 | slot/port | Enter a single interface in slot/port format. |
| | interface range | Enter interface range in the slot/port format use hyphen for range e.g 1/2-1/4. |
| | interface list | Enter interface list in the slot/port format use comma to separate e.g 1/2,1/4,... . |
| | vlan/<vlan-id> | Enter a single vlan interface e.g vlan/222. |
| | vlan range | Enter vlan interface range e.g. vlan/1-vlan/3. |
| | vlan list | Enter vlan interface list use comma to separate e.g. vlan/1,vlan/3. |

### 51.1.9 ip static-mcast mroute modify

Modify a new static multicast route instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mroute modify <P-1> inbound <P-2> [source-address <P-3>] [source-mask <P-4>] group-address <P-5> [group-mask <P-6>] [outbound <P-7>]`

`inbound`: Configure inbound interface
`[source-address]`: Configure IPv4 source address
`[source-mask]`: Configure IPv4 source netmask
`group-address`: Configure IPv4 group address
`[group-mask]`: Configure IPv4 group netmask
`[outbound]`: Configure outbound interface

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast route ID in the given range. |
| P-2 | slot no./port no. | |
| P-3 | A.B.C.D | IPv4 address. |
| P-4 | 0..32 | Prefix length netmask. |
| P-5 | A.B.C.D | IPv4 address. |
| P-6 | 0..32 | Prefix length netmask. |
| P-7 | slot/port | Enter a single interface in slot/port format. |
| | interface range | Enter interface range in the slot/port format use hyphen for range e.g 1/2-1/4. |
| | interface list | Enter interface list in the slot/port format use comma to separate e.g 1/2,1/4,... . |
| | vlan/<vlan-id> | Enter a single vlan interface e.g vlan/222. |
| | vlan range | Enter vlan interface range e.g. vlan/1-vlan/3. |
| | vlan list | Enter vlan interface list use comma to separate e.g. vlan/1,vlan/3. |

### 51.1.10 ip static-mcast mroute delete

Delete an existing static multicast route instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mroute delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast route ID in the given range. |

### 51.1.11 ip static-mcast mroute enable

Enables a rule from static multicast route table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mroute enable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast route ID in the given range. |

### 51.1.12 ip static-mcast mroute disable

Disables a rule from static multicast route table.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast mroute disable <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | Static multicast route ID in the given range. |

## 51.2 ip

IP interface commands.

### 51.2.1 ip static-mcast operation

Enable or disable a multicast static route instance.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip static-mcast operation`

- **no ip static-mcast operation**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no ip static-mcast operation`

## 51.3 show

Display device options and settings.

### 51.3.1 show ip mcast global

Display the global multicast information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip mcast global`

### 51.3.2 show ip static-mcast global

Display the global static multicast information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip static-mcast global`

### 51.3.3 show ip static-mcast interface

Display the interface specific information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip static-mcast interface [<P-1>]`

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

### 51.3.4 show ip static-mcast mgroup

Display the multicast routing group information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip static-mcast mgroup`

### 51.3.5 show ip static-mcast mroute

Display the multicast routing table information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip static-mcast mroute`

# 52 Storm Control

## 52.1 storm-control

Configure the global storm-control settings.

### 52.1.1 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`

## 52.2 storm-control

Storm control commands

### 52.2.1 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`

### 52.2.2 storm-control ingress unit

Set unit.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `storm-control ingress unit <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | percent | `Metering unit expressed in percentage of bandwidth.` |
| | pps | `Metering unit expressed in packets per second.` |

### 52.2.3 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`

### 52.2.4 storm-control ingress unicast threshold

Set the threshold value for unicast frames with unknown destination.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `storm-control ingress unicast threshold <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..14880000 | `Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.` |

### 52.2.5 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`

### 52.2.6 storm-control ingress multicast threshold

Set the threshold value for multicast frames.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `storm-control ingress multicast threshold <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..14880000 | `Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.` |

### 52.2.7 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`

### 52.2.8 storm-control ingress broadcast threshold

Set the threshold value for broadcast frames.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `storm-control ingress broadcast threshold <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..14880000 | `Enter a number in the given range. If the configured unit is percent enter a number in (0..100) range.` |

## 52.3 show

Display device options and settings.

### 52.3.1 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`

### 52.3.2 show storm-control ingress

Display the storm control ingress parameters.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show storm-control ingress [<P-1>]`

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

# 53 System

## 53.1 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.

### 53.1.1 system name

Edit the name of the device. The system name consists of an alphanumeric ASCII character string with 0..255 characters.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `system name <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 255 characters. |

### 53.1.2 system location

Edit the location of the device. The system location consists of an alphanumeric ASCII character string with 0..255 characters.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `system location <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 255 characters. |

### 53.1.3 system contact

Edit the contact information for the person responsible for the device. The contact data consists of an alphanumeric ASCII character string with 0..255 characters.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `system contact <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 255 characters. |

### 53.1.4 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`

### 53.1.5 system pre-login-banner text

Edit the text for the pre-login banner (C printf format syntax allowed: \n\t) The device allows you to edit an alphanumeric ASCII character string with up to 512 characters.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `system pre-login-banner text <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | Enter a user-defined text, max. 512 characters (allowed characters are from ASCII 32 to 127). |

### 53.1.6 system resources operation

Enable or disable the measurement operation.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `system resources operation`

- **no system resources operation**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no system resources operation`

## 53.2 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.

### 53.2.1 temperature upper-limit

Configure the upper temperature limit.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `temperature upper-limit <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | -99..99 | `Upper temperature threshold ([C], default 70).` |

### 53.2.2 temperature lower-limit

Configure the lower temperature limit.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `temperature lower-limit <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | -99..99 | `Lower temperature threshold ([C], default 0).` |

## 53.3 hardware

The Hardware LAN bypass feature ensures that traffic passes freely between interface pairs when system is fully up and is running an Operating System or when system is in a shutdown state

### 53.3.1 hardware runtime-bypass

Enable or disable Run-time hardware LAN bypass.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `hardware runtime-bypass`

- **no hardware runtime-bypass**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no hardware runtime-bypass`

### 53.3.2 hardware systemoff-bypass

Enable or disable System-off hardware LAN bypass.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `hardware systemoff-bypass`

- **no hardware systemoff-bypass**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no hardware systemoff-bypass`

## 53.4 show

Display device options and settings.

### 53.4.1 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`

### 53.4.2 show system info

Display the system related information.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show system info`

### 53.4.3 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`

### 53.4.4 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`

### 53.4.5 show system temperature limits

Display the temperature limits.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show system temperature limits`

### 53.4.6 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`

### 53.4.7 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`

### 53.4.8 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`

### 53.4.9 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`

### 53.4.10 show hardware runtime-bypass

Display runtime-bypass state of hardware bypass.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show hardware runtime-bypass`

### 53.4.11 show hardware systemoff-bypass

Display systemoff-bypass state of hardware bypass.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show hardware systemoff-bypass`

# 54 Tracking

## 54.1 track

Configure tracking instances on the device.

### 54.1.1 track add

Create a tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |

### 54.1.2 track delete

Delete a tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |

### 54.1.3 track enable

Activate a tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track enable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |

### 54.1.4 track disable

Deactivate a tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track disable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |

### 54.1.5 track trap

Enable / Disable the StateChange trap for the corresponding tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track trap <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |

- **no track trap**
  Disable the option
  - Mode: Global Config Mode
  - Privilege Level: Operator
  - Format: no track trap <P-1> <P-2>

### 54.1.6 track description

Set the description for the corresponding tracking instance.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track description <P-1> <P-2> <P-3>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | interface | interface tracking |
| | ping | ping tracking |
| | logical | logical tracking |
| P-2 | 1..256 | Enter a number in the given range. |
| P-3 | string | Enter a user-defined text, max. 255 characters. |

### 54.1.7 track modify interface

Modify the configuration of an interface tracking instance.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track modify interface <P-1> [interface <P-2>] [linkup-delay <P-3>] [linkdown-delay <P-4>]

[interface]: Set the interface number of the interface tracking instance.
[linkup-delay]: Set the linkup-delay of the interface tracking instance
[linkdown-delay]: Set the linkdown-delay of the interface tracking instance

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | slot no./port no. | |
| P-3 | 0..255 | Enter a number in the given range. |
| P-4 | 0..255 | Enter a number in the given range. |

### 54.1.8 track modify ping

Modify the configuration of a ping tracking instance.
- Mode: Global Config Mode
- Privilege Level: Operator
- Format: track modify ping <P-1> <P-2> [interface <P-2>][address <P-3>]
  [interval <P-4>] [miss <P-5>] [success <P-6>] [timeout <P-7>] [ttl <P-8>]
  [interface]: Set the source interface number of the ping tracking instance.
  [address]: Set the address of the router to be monitored.
  [interval]: Set the number of milliseconds between the pings to the target router address.
  [miss]: Set the number of consecutive ping misses until the tracked object is considered to be down.
  [success]: Set the of consecutive ping successes until the tracked object is considered to be up.
  [timeout]: Set the timeout in milliseconds for a ping reply.
  [ttl]: Set the time to live for a ping request packet.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | slot no./port no. | |
| P-2 | slot no./port no. | |
| P-3 | a.b.c.d | IP address. |
| P-4 | 100..20000 | value for ping tracking interval range between 100 and 20000. |
| P-5 | 1..10 | value for ping tracking interval range between 1 and 10. |
| P-6 | 1..10 | value for ping tracking range between 1 and 10. |
| P-7 | 10..10000 | value for ping tracking time range between 10 and 10000. |
| P-8 | 1..255 | Enter a number in the given range. |

### 54.1.9 track modify logical

Modify the configuration of a logical tracking instance.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `track modify logical <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | slot no./port no. | |
| `P-2` | string | Track instance. |
| `P-3` | and | `AND operator` |
| | or | `OR operator` |
| `P-4` | string | Track instance. |

## 54.2 show

Display device options and settings.

### 54.2.1 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`

### 54.2.2 show track interface

Display the information and settings for the interface tracking instances.

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

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

### 54.2.3 show track ping

Display the information and settings for the ping tracking instances.

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

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

### 54.2.4 show track logical

Display the information and settings for the logical tracking instances.

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

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

### 54.2.5 show track application

Display the information on tracking application registrations.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show track application`

# 55 L3 Relay

## 55.1 ip

Set IP parameters.

### 55.1.1 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`

### 55.1.2 ip udp-helper server add

Add a global relay agent to process DHCP client requests and UDP broadcast packets received on any interface.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.1.3 ip udp-helper server delete

Delete a global relay agent.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.1.4 ip udp-helper server enable

Enable a global relay agent to process DHCP client requests and UDP broadcast packets received on any interface.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server enable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.1.5 ip udp-helper server disable

Disable a global relay agent from processing DHCP client requests and UDP broadcast packets received on any interface.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server disable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.1.6 ip udp-helper maxhopcount

Configure the DHCP relay maximum hop count.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper maxhopcount <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..16 | `Enter a number in the given range.` |

### 55.1.7 ip udp-helper minwaittime

Configure DHCP relay minimum wait time in seconds.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper minwaittime <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..100 | `Enter a number in the given range.` |

### 55.1.8 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`

## 55.2 ip

IP interface commands.

### 55.2.1 ip udp-helper server add

Add a relay agent to process DHCP client requests and UDP broadcast packets received on a specific interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.2.2 ip udp-helper server delete

Delete a relay agent from a specific interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server delete <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |
| `P-2` | A.B.C.D | `IP address.` |

### 55.2.3 ip udp-helper server enable

Enable a relay agent to process DHCP client requests and UDP broadcast packets received on a specific interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip udp-helper server enable <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | dhcp | DHCP server port number. |

| Parameter | Value | Meaning |
|---|---|---|
| P-2 | A.B.C.D | IP address. |

### 55.2.4 ip udp-helper server disable

Disable a relay agent from processing DHCP client requests and UDP broadcast packets received on a specific interface.

- Mode: Interface Range Mode
- Privilege Level: Operator
- Format: ip udp-helper server disable <P-1> <P-2>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | dhcp | DHCP server port number. |
| P-2 | A.B.C.D | IP address. |

## 55.3 show

Display device options and settings.

### 55.3.1 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

### 55.3.2 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

### 55.3.3 show ip udp-helper interface

Display the DHCP and UDP relays defined for specific interfaces.

- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ip udp-helper interface [<P-1>]

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

### 55.3.4 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

## 55.4 clear

Clear several items.

### 55.4.1 clear ip udp-helper

Reset IP helper and DHCP relay statistics.

- Mode: Privileged Exec Mode
- Privilege Level: Operator
- Format: clear ip udp-helper

# 56 Traps

## 56.1 snmp

Configure of SNMP versions and traps.

### 56.1.1 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`

### 56.1.2 snmp trap mode

Enable/disable SNMP trap entry.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp trap mode <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | `<name> Trap name (1 to 32 characters)` |

- **no snmp trap mode**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no snmp trap mode <P-1>`

### 56.1.3 snmp trap delete

Delete SNMP trap entry.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp trap delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | `<name> Trap name (1 to 32 characters)` |

### 56.1.4 snmp trap add

Add SNMP trap entry.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `snmp trap add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | string | `<name> Trap name (1 to 32 characters)` |
| `P-2` | a.b.c.d | `a.b.c.d Single IP address.` |
| | a.b.c.d:n | `a.b.c.d:n Address with port.` |

## 56.2 show

Display device options and settings.

### 56.2.1 show snmp traps

Display the SNMP traps.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show snmp traps`

# 57 Unicast Routing

## 57.1 routing

Create routing on VLAN.

### 57.1.1 routing add

Enable routing on VLAN
- Mode: `VLAN Database Mode`
- Privilege Level: `Operator`
- Format: `routing add <P-1>`

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

### 57.1.2 routing delete

Disable routing on VLAN
- Mode: `VLAN Database Mode`
- Privilege Level: `Operator`
- Format: `routing delete <P-1>`

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

## 57.2 ip

Set IP parameters.

### 57.2.1 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`

### 57.2.2 ip proxy-arp max-delay

Configure the maximum time a Proxy ARP response can be delayed
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip proxy-arp max-delay <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..1000 | Enter Proxy ARP max response delay ms |

## 57.3 ipv6

Set IPv6 parameters.

### 57.3.1 ipv6 routing

Enables or disables IPv6 Routing globally on the device.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 routing`

- **no ipv6 routing**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Operator`
  - Format: `no ipv6 routing`

## 57.4 ipv6

Set IPv6 parameters.

### 57.4.1 ipv6 route add

Add a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 route add <P-1> <P-2> <P-3> [preference <P-4>]`

`[preference]`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-2` | 0..128 | `IPv6 prefix length.` |
| `P-3` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-4` | 1..255 | `Enter a number in the given range.` |

### 57.4.2 ipv6 route modify

Modify a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 route modify <P-1> <P-2> <P-3> [preference <P-4>]`

`[preference]`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-2` | 0..128 | `IPv6 prefix length.` |
| `P-3` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-4` | 1..255 | `Enter a number in the given range.` |

### 57.4.3 ipv6 route delete

Delete a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ipv6 route delete <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-2` | 0..128 | `IPv6 prefix length.` |
| `P-3` | a:b:c:d:e:f:g:h | `IPv6 address` |

## 57.5 show

Display device options and settings.

### 57.5.1 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`

## 57.6 show

Display device options and settings.

### 57.6.1 show ip interface

Display the interface parameters.

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

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

### 57.6.2 show ip statistics

Display the global IP statistics.

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

## 57.7 ip

IP interface commands.

### 57.7.1 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`

### 57.7.2 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`

### 57.7.3 ip address secondary

Designates whether an IP Address is a secondary address on this interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip address secondary <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | IP address. |
| `P-2` | a.b.c.d | IP subnet mask. |

**no ip address secondary**

Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ip address secondary <P-1>`

### 57.7.4 ip address primary

Designates whether an IP Address is a primary address on this interface.

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip address primary <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | IP address. |
| `P-2` | a.b.c.d | IP subnet mask. |

**no ip address primary**

Disable the option

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ip address primary`

### 57.7.5 ip mtu

Set MTU size for IP protocol

- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ip mtu <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 68..12266 | `Set the MTU value.` |

### 57.7.6 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`

## 57.8 ipv6

IPv6 interface commands.

### 57.8.1 ipv6 routing

This command enables/disables routing for an interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ipv6 routing`

**no ipv6 routing**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ipv6 routing`

### 57.8.2 ipv6 nd-proxy operation

Enables or disables ND Proxy on the interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ipv6 nd-proxy operation`

**no ipv6 nd-proxy operation**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ipv6 nd-proxy operation`

### 57.8.3 ipv6 nd-ra operation

Enables or disables ND router advertisement on the interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ipv6 nd-ra operation`

**no ipv6 nd-ra operation**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ipv6 nd-ra operation`

### 57.8.4 ipv6 address

Create an IPv6 Address and prefix length for an interface.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ipv6 address <P-1> <P-2> [eui64] [anycast]`

`[eui64]`: EUI64 mode.
`[anycast]`: Anycast mode.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | a:b:c:d:e:f:g:h | `IPv6 address` |
| `P-2` | 0..128 | `IPv6 prefix length.` |

**no ipv6 address**
Disable the option
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `no ipv6 address <P-1> [eui64] [anycast]`

### 57.8.5 ipv6 icmp redirects

Enables or disables the generation of ICMP Redirect messages.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `ipv6 icmp redirects`

- **no ipv6 icmp redirects**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no ipv6 icmp redirects`

## 57.9 show

Display device options and settings.

### 57.9.1 show ipv6 global

Display the summary information of the global IPv6.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 global`

## 57.10 show

Display device options and settings.

### 57.10.1 show ipv6 interface

Display the ipv6 interface parameters.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 interface [<P-1>]`

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

## 57.11 show

Display device options and settings.

### 57.11.1 show ipv6 route all

Display the static, dynamic and local routes.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 route all`

### 57.11.2 show ipv6 route local

Display the local routes.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 route local`

### 57.11.3 show ipv6 route static

Display the static routes.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 route static`

### 57.11.4 show ipv6 route entry

Display the router route entry information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipv6 route entry <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | a:b:c:d:e:f:g:h | IPv6 address |
| P-2 | 0..128 | IPv6 prefix length. |

## 57.12 ip

Set IP parameters.

### 57.12.1 ip route add

Add a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route add <P-1> <P-2> <P-3> [preference <P-4>]`

`[preference]`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IPv4 address. |
| P-2 | A.B.C.D | IPv4 netmask address. |
| P-3 | A.B.C.D | Next hop IP address. |
| P-4 | 1..255 | Enter a number in the given range. |

### 57.12.2 ip route modify

Modify a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route modify <P-1> <P-2> <P-3> [preference <P-4>]`

`[preference]`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IPv4 address. |
| P-2 | A.B.C.D | IPv4 netmask address. |
| P-3 | A.B.C.D | Next hop IP address. |
| P-4 | 1..255 | Enter a number in the given range. |

### 57.12.3 ip route delete

Delete a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route delete <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IPv4 address. |
| P-2 | A.B.C.D | IPv4 netmask address. |
| P-3 | A.B.C.D | Next hop IP address. |

### 57.12.4 ip route distance

Default preference for static routes.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route distance <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..255 | Enter a number in the given range. |

### 57.12.5 ip route track add

Add a track-id for a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route track add <P-1> <P-2> <P-3> <P-4>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IPv4 address.` |
| `P-2` | A.B.C.D | `IPv4 netmask address.` |
| `P-3` | A.B.C.D | `Next hop IP address.` |
| `P-4` | string | Track instance. |

### 57.12.6 ip route track delete

Remove a track-id for a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip route track delete <P-1> <P-2> <P-3>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IPv4 address.` |
| `P-2` | A.B.C.D | `IPv4 netmask address.` |
| `P-3` | A.B.C.D | `Next hop IP address.` |

### 57.12.7 ip default-route add

Add a static default route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip default-route add <P-1> [preference <P-2>]`

`[preference]`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IP address.` |
| `P-2` | 1..255 | `Enter a number in the given range.` |

### 57.12.8 ip default-route modify

Modify a static default route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip default-route modify <P-1> preference <P-2>`

`preference`: Change the preference value of a route.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IP address.` |
| `P-2` | 1..255 | `Enter a number in the given range.` |

### 57.12.9 ip default-route delete

Delete a static default route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip default-route delete <P-1>`

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

### 57.12.10ip default-route track add

Add a track-id for a static route entry.

- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip default-route track add <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | A.B.C.D | `IP address.` |
| `P-2` | string | Track instance. |

### 57.12.11ip default-route track delete

Remove a track-id for a static route entry.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip default-route track delete <P-1>`

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

### 57.12.12ip loopback add

Enable a loopback interface.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip loopback add <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Enter the loopback id in the given range. |

### 57.12.13ip loopback delete

Disable a loopback interface.
- Mode: `Global Config Mode`
- Privilege Level: `Operator`
- Format: `ip loopback delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..8 | Enter the loopback id in the given range. |

### 57.12.14ip 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`

### 57.12.15ip 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`

### 57.12.16ip 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>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..2147483647 | configure the interval. |

### 57.12.17ip 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>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..200 | configure the burst-size. |

## 57.13 show

Display device options and settings.

### 57.13.1 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`

### 57.13.2 show ip route local

Display the local routes.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip route local`

### 57.13.3 show ip route static

Display the static routes.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip route static`

### 57.13.4 show ip route entry

Display the router route entry information.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ip route entry <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | A.B.C.D | IPv4 address. |
| P-2 | A.B.C.D | IPv4 netmask address. |

### 57.13.5 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`

### 57.13.6 show ip entry

Display the router route entry information.

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

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

# 58 Users

## 58.1 users

Manage Users and User Accounts.

### 58.1.1 users add

Add a new user.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |

### 58.1.2 users delete

Delete an existing user.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |

### 58.1.3 users enable

Enable user.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |

### 58.1.4 users disable

Disable user.

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |

### 58.1.5 users password

Change user password.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users password <P-1> [<P-2>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | string | Enter a user-defined text, max. 64 characters. |

### 58.1.6 users snmpv3 authentication

Specify authentication setting for a user.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users snmpv3 authentication <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | md5 | MD5 as SNMPv3 user authentication mode. |
| | sha1 | SHA1 as SNMPv3 user authentication mode. |

### 58.1.7 users snmpv3 encryption

Specify encryption settings for a user.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users snmpv3 encryption <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | none | SNMPv3 encryption method is none. |
| | des | DES as SNMPv3 encryption method. |
| | aescfb128 | AES-128 as SNMPv3 encryption method. |

### 58.1.8 users access-role

Specify snmpv3 access role for a user.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users access-role <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | slot no./port no. | |

### 58.1.9 users lock-status

Set the lockout status of a specified user.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users lock-status <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | unlock | Unlock specific user. User can login again. |

### 58.1.10 users auto-unlock-timer

Set the time (in minutes) after which a locked account is automatically unlocked.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users auto-unlock-timer <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | 1..720 | Auto unlock time in minutes. |

### 58.1.11 users password-policy-check

Set password policy check option. The device checks the "minimum password length", regardless of the setting for this option.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `users password-policy-check <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | string | <user> User name (up to 32 characters). |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

## 58.2 show

Display device options and settings.

### 58.2.1 show users

Display the users and user accounts information.

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

# 59 Virtual LAN (VLAN)

## 59.1 name

### 59.1.1 name

Assign a name to a VLAN
- Mode: `VLAN Database Mode`
- Privilege Level: `Operator`
- Format: `name <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..4042 | Enter the VLAN ID. |
| P-2 | string | Enter a user-defined text, max. 32 characters. |

## 59.2 vlan

Creation and configuration of VLANS.

### 59.2.1 vlan add

Create a VLAN
- Mode: `VLAN Database Mode`
- Privilege Level: `Operator`
- Format: `vlan add <P-1>`

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

### 59.2.2 vlan delete

Delete a VLAN
- Mode: `VLAN Database Mode`
- Privilege Level: `Operator`
- Format: `vlan delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 2..4042 | Enter VLAN ID. VLAN ID 1 can not be deleted or created |

## 59.3 vlan

Configure 802.1Q port parameters for VLANs.

### 59.3.1 vlan acceptframe

Configure how to handle tagged/untagged frames received.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan acceptframe <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | all | Untagged frames or priority frames received on this interface are accepted and assigned the value of the interface VLAN ID for this port. |
| | vlanonly | Only frames received with a VLAN tag will be forwarded. All other frames will be dropped. |

### 59.3.2 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`

### 59.3.3 vlan priority

Configure the priority for untagged frames.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan priority <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..7 | `Enter a number in the given range.` |

### 59.3.4 vlan pvid

Configure the VLAN id for a specific port.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan pvid <P-1>`

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

### 59.3.5 vlan tagging

Enable or disable tagging for a specific VLAN port.
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan tagging <P-1>`

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

- **no vlan tagging**
  Disable the option
  - Mode: `Interface Range Mode`
  - Privilege Level: `Operator`
  - Format: `no vlan tagging <P-1>`

### 59.3.6 vlan participation include

vlan participation to include
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan participation include <P-1>`

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

### 59.3.7 vlan participation exclude

vlan participation to exclude
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan participation exclude <P-1>`

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

### 59.3.8 vlan participation auto

vlan participation to auto
- Mode: `Interface Range Mode`
- Privilege Level: `Operator`
- Format: `vlan participation auto <P-1>`

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

## 59.4 show

Display device options and settings.

### 59.4.1 show vlan id

Display the configuration of a single specified VLAN.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show vlan id <P-1>`

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

### 59.4.2 show vlan brief

Display the general VLAN parameters.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show vlan brief`

### 59.4.3 show vlan port

Display the VLAN configuration of a single port.
- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show vlan port [<P-1>]`

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

### 59.4.4 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`

### 59.4.5 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`

## 59.5 network

Configure the inband and outband connectivity.

### 59.5.1 network management vlan

Configure the management VLAN ID of the switch.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network management vlan <P-1>`

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

### 59.5.2 network management priority dot1p

Configure the management VLAN priority of the switch.
- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network management priority dot1p <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 0..7 | Enter a number in the given range. |

### 59.5.3 network management priority ip-dscp

Configure the management VLAN ip-dscp priority of the switch.

- Mode: `Privileged Exec Mode`
- Privilege Level: `Operator`
- Format: `network management priority ip-dscp <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 0..63 | `Enter a number in the given range.` |

# 60 Virtual Private Network (VPN)

## 60.1 ipsec

Configure IPsec VPN settings.

### 60.1.1 ipsec certificate delete

Delete a certificate uploaded to the device.
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec certificate delete <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..100 | `Certificate Table Index.` |

### 60.1.2 ipsec certificate upload passphrase

Passphrase that will be used to decrypt the next uploaded file, before storing on the device (note: will not be stored after the next upload, no matter if it is used or not!)
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec certificate upload passphrase <P-1>`

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

### 60.1.3 ipsec connection add

Add a IPsec VPN connection (use next free index if none submitted).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec connection add <P-1> [name <P-2>]`

`[name]`: IPsec VPN connection name.

| Parameter | Value | Meaning |
|---|---|---|
| `P-1` | 1..256 | `VPN connection index.` |
| `P-2` | string | `Enter a user-defined text, max. 128 characters.` |

### 60.1.4 ipsec connection modify

Modify a IPsec VPN connection (index in connection is mandatory).
- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec connection modify <P-1> name <P-2> certificate ca add <P-3> clear local <P-4> [remote <P-5>] [privkey <P-6>] [passphrase <P-7>] debug informational <P-8> not-handled <P-9> access [method <P-10>] [pre-shared-key <P-11>] [local-type <P-12>] [local-id <P-13>] [remote-type <P-14>] [remote-id <P-15>] key-exchange mode [protocol <P-16>] [startup <P-17>] [ikev1-dpd-timeout <P-18>] [lifetime <P-19>] [exchange-mode <P-20>] [margintime <P-21>] [re-authenticate <P-22>] algorithms [key-agreement <P-23>] [integrity <P-24>] [encryption <P-25>] endpoints [local-address <P-26>] [remote-address <P-27>] data-exchange mode [lifetime <P-28>] algorithms [key-agreement <P-29>] [integrity <P-30>] [encryption <P-31>]`

`name`: IPsec VPN connection name.
`certificate`: Manage certificates for this connection.
`ca`: Set the CA certificate file name(s). Also supports comma-separated chains.
`add`: Add a CA file name to the current connection.
`clear`: Remove all the CA file names added to the current connection.
`local`: Set the file name of the certificate that will identify the current device.
`[remote]`: Set the file name of the certificate that will identify the remote device.
`[privkey]`: Set the file name of the private key (if it is encrypted and cannot be automatically matched to the certificate).
`[passphrase]`: Set the passphrase to be used with an encrypted private key or PKCS12 encrypted container (warning: will be stored in the config!).
`debug`: IPsec VPN connection additonal debugging information to event log.

informational: Enable or disable debug of informational messages.
not-handled: Enable or disable debug of not handled messages.
access: IPsec VPN access.
[method]: Authentication method to be used.
[pre-shared-key]: Preshared key (passphrase).
[local-type]: Type of local peer identifier.
[local-id]: Local peer identifier.
[remote-type]: Type of remote peer identifier.
[remote-id]: Remote peer identifier.
key-exchange: Key exchange parameters.
mode: Key exchange mode.
[protocol]: Version of the key exchange protocol.
[startup]: Key exchange at startup.
[ikev1-dpd-timeout]: IKEv1 Dead Peer Detection (DPD) timeout.
[lifetime]: IKE security association lifetime.
[exchange-mode]: IKE exchange mode.
[margintime]: IKE and IPsec margintime for re-keying before timeout.
[re-authenticate]: Re-authenticate at end of IKE lifetime (IKEv2 only).
algorithms: Key exchange algorithms.
[key-agreement]: Key agreement algorithm to be used.
[integrity]: Integrity (MAC) algorithm to be used in IKEv2.
[encryption]: Encryption algorithm to be used.
endpoints: IPsec VPN tunnel endpoints.
[local-address]: Address of local security gateway.
[remote-address]: Address of remote security gateway.
data-exchange: Data exchange parameters.
mode: Data exchange mode.
[lifetime]: Lifetime of IPsec SA.
algorithms: Data exchange algorithms.
[key-agreement]: Key agreement algorithm to be used.
[integrity]: Integrity (MAC) algorithm to be used in IPsec.
[encryption]: Algorithm to be used for IPsec payload encryption.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |
| P-2 | string | Enter a user-defined text, max. 128 characters. |
| P-3 | string | Filename. |
| P-4 | string | Filename. |
| P-5 | string | Filename. |
| P-6 | string | Filename. |
| P-7 | string | Enter a user-defined text, max. 128 characters. |
| P-8 | debug_inform | debug informational |
| P-9 | debug_unhandled | debug unhandled |
| P-10 | | |
| | psk | Pre-shared key. |
| | x509rsa | Individual X.509 RSA certificates. |
| | pkcs12 | Single PKCS12 file with all certificates (including CA). |
| P-11 | string | Enter a user-defined text, max. 128 characters. |
| P-12 | | |
| | default | Local IPv4 address. |
| | address | IPv4 address or host name (use from address field). |
| | id | Use identifier. |
| P-13 | string | Enter a user-defined text, max. 255 characters. |
| P-14 | | |
| | any | Not checked. |
| | address | IPv4 address or host name (use from address field). |
| | id | Use identifier. |
| P-15 | string | Enter a user-defined text, max. 255 characters. |
| P-16 | | |
| | auto | Accept IKEv1/v2 as responder, start with IKEv2 as initiator. |
| | v1 | IKE version 1 (ISAKMP). |
| | v2 | IKE version 2. |

| Parameter | Value | Meaning |
|---|---|---|
| P-17 | | |
| | initiator | Initiates an IKE at startup. |
| | responder | Peer starts the IKE initiation. |
| P-18 | 0..86400 | Interval between liveness messages in seconds, 0 to disable. |
| P-19 | 300..86400 | Lifetime of IKE SA in seconds (Max. 24h). |
| P-20 | | |
| | main | Initiates or Accepts main mode only. |
| | aggressive | Initiates or Accepts aggressive mode. |
| P-21 | 1..1800 | Margintime for re-keying before timeout. |
| P-22 | true | True |
| | false | False |
| P-23 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | modp1024 | RSA with 1024 bits modulus (DH Group 2). |
| | modp1536 | RSA with 1536 bits modulus (DH Group 5). |
| | modp2048 | RSA with 2048 bits modulus (DH Group 14). |
| | modp3072 | RSA with 3072 bits modulus (DH Group 15). |
| | modp4096 | RSA with 4096 bits modulus (DH Group 16). |
| | ecp256 | NIST Elliptic Curve with 256 bits (DH Group 19). |
| | ecp384 | NIST Elliptic Curve with 384 bits (DH Group 20). |
| | ecp521 | NIST Elliptic Curve with 521 bits (DH Group 21). |
| P-24 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | hmacmd5 | HMAC-MD5 |
| | hmacsha1 | HMAC-SHA1 |
| | hmacsha256 | HMAC-SHA256 |
| | hmacsha384 | HMAC-SHA384 |
| | hmacsha512 | HMAC-SHA512 |
| P-25 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | des | DES |
| | des3 | Triple-DES |
| | aes128 | AES with 128 key bits. |
| | aes192 | AES with 192 key bits. |
| | aes256 | AES with 256 key bits. |
| P-26 | any | Use the primary IP address of external interface. |
| | a.b.c.d | a.b.c.d IP address. |
| | nu,nu-nu | host.name.domain FQDN |
| P-27 | any | Use the primary IP address of external interface. |
| | a.b.c.d | a.b.c.d IP address. |
| | nu,nu-nu | host.name.domain FQDN |
| P-28 | 300..28800 | Lifetime of IPsec SA in seconds (Max. 8h). |
| P-29 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | modp1024 | RSA with 1024 bits modulus (DH Group 2). |
| | modp1536 | RSA with 1536 bits modulus (DH Group 5). |
| | modp2048 | RSA with 2048 bits modulus (DH Group 14). |
| | modp3072 | RSA with 3072 bits modulus (DH Group 15). |
| | modp4096 | RSA with 4096 bits modulus (DH Group 16). |
| | none | No perfect forward secrecy. |
| | ecp256 | NIST Elliptic Curve with 256 bits (DH Group 19). |
| | ecp384 | NIST Elliptic Curve with 384 bits (DH Group 20). |
| | ecp521 | NIST Elliptic Curve with 521 bits (DH Group 21). |
| P-30 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | hmacmd5 | HMAC-MD5 |
| | hmacsha1 | HMAC-SHA1 |
| | hmacsha256 | HMAC-SHA256 |
| | hmacsha384 | HMAC-SHA384 |
| | hmacsha512 | HMAC-SHA512 |

| Parameter | Value | Meaning |
|---|---|---|
| P-31 | | |
| | any | Accept all algorithms as responder, use default as initiator. |
| | des | DES |
| | des3 | Triple-DES |
| | aes128 | AES with 128 key bits. |
| | aes192 | AES with 192 key bits. |
| | aes256 | AES with 256 key bits. |
| | aes128ctr | AES-COUNTER with 128 key bits. |
| | aes192ctr | AES-COUNTER with 192 key bits. |
| | aes256ctr | AES-COUNTER with 256 key bits. |
| | aes128gcm64 | AES-GCM with 64 bit ICV with 128 key bits. |
| | aes128gcm96 | AES-GCM with 96 bit ICV with 128 key bits. |
| | aes128gcm128 | AES-GCM with 128 bit ICV with 128 key bits. |
| | aes192gcm64 | AES-GCM with 64 bit ICV with 192 key bits. |
| | aes192gcm96 | AES-GCM with 96 bit ICV with 192 key bits. |
| | aes192gcm128 | AES-GCM with 128 bit ICV with 192 key bits. |
| | aes256gcm64 | AES-GCM with 64 bit ICV with 256 key bits. |
| | aes256gcm96 | AES-GCM with 96 bit ICV with 256 key bits. |
| | aes256gcm128 | AES-GCM with 128 bit ICV with 256 key bits. |

- **no ipsec connection modify**
  Disable the option
  - Mode: `Global Config Mode`
  - Privilege Level: `Administrator`
  - Format: `no ipsec connection modify name certificate ca add clear local [remote] [privkey] [passphrase] debug informational <P-8> not-handled <P-9> access [method] [pre-shared-key] [local-type] [local-id] [remote-type] [remote-id] key-exchange mode [protocol] [startup] [ikev1-dpd-timeout] [lifetime] [exchange-mode] [margintime] [re-authenticate] algorithms [key-agreement] [integrity] [encryption] endpoints [local-address] [remote-address] data-exchange mode [lifetime] algorithms [key-agreement] [integrity] [encryption]`

### 60.1.5 ipsec connection status

Enable or disable a IPsec VPN connection (index in connection is mandatory).

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec connection status <P-1> <P-2>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |
| P-2 | enable | Enable the option. |
| | disable | Disable the option. |

### 60.1.6 ipsec connection delete

Delete a IPsec VPN connection (index in connection is mandatory).

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

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.1.7 ipsec traffic-selector

IPsec VPN traffic selectors.

- Mode: `Global Config Mode`
- Privilege Level: `Administrator`
- Format: `ipsec traffic-selector <P-1> add <P-2> [name <P-3>] delete <P-4> modify <P-5> [name <P-6>] [source-net <P-7>] [source-restriction <P-8>] [dest-net <P-9>] [dest-restriction <P-10>] status <P-11> <P-12>`

`add`: Add new traffic selector.
`[name]`: Traffic selector ID.
`delete`: Delete an existing traffic selector.
`modify`: Modify an existing traffic selector.

[name]: Traffic selector ID.
[source-net]: Source address for the traffic selector.
[source-restriction]: Source restriction for the traffic selector
[dest-net]: Destination address for the traffic selector.
[dest-restriction]: Destination restriction for the traffic selector.
status: Enable or disable an existing traffic selector.

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |
| P-2 | 1..16 | Index of the traffic selector (unique inside of a IPsec VPN connection). |
| P-3 | string | Enter a user-defined text, max. 128 characters. |
| P-4 | 1..16 | Index of the traffic selector (unique inside of a IPsec VPN connection). |
| P-5 | 1..16 | Index of the traffic selector (unique inside of a IPsec VPN connection). |
| P-6 | string | Enter a user-defined text, max. 128 characters. |
| P-7 | a.b.c.d | a.b.c.d Single IP address. |
| | a.b.c.d | a.b.c.d Address range in CIDR notation. |
| | any | Any IP address. |
| P-8 | string | 'protocol/port' Traffic selector restriction can be given as string, e.g. tcp/http or can be given as numbers, e.g. 6/80 (=tcp/http)'protocol/port' Traffic selector restriction can be given as string, e.g. http (= any/http) or can be given as numbers,e.g. /53 (= any/53) 'protocol/port 'Traffic selector restriction can be given as string, e.g. udp (= udp/any) or can be given as numbers, e.g. 17 (= 17(udp)/any) an empty restriction '' means to have no restriction (any/any) |
| P-9 | a.b.c.d | a.b.c.d Single IP address. |
| | a.b.c.d | a.b.c.d Address range in CIDR notation. |
| | any | Any IP address. |
| P-10 | string | 'protocol/port' Traffic selector restriction can be given as string, e.g. tcp/http or can be given as numbers, e.g. 6/80 (=tcp/http)'protocol/port' Traffic selector restriction can be given as string, e.g. http (= any/http) or can be given as numbers, e.g. /53 (= any/53)'protocol/port' Traffic selector restriction can be given as string, e.g. udp (= udp/any) or can be given as numbers, e.g. 17 (= 17(udp)/any) an empty restriction '' means to have no restriction (any/any) |
| P-11 | 1..256 | Index of the traffic selector (unique inside of a IPsec VPN connection). |
| P-12 | enable | Enable the option. |
| | disable | Disable the option. |

## 60.2 show

Display device options and settings.

### 60.2.1 show ipsec general

General IPsec VPN settings.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ipsec general

### 60.2.2 show ipsec connections summary

Overview of all configured connections.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ipsec connections summary

### 60.2.3 show ipsec connections access

IPsec connection access settings.
- Mode: Command is in all modes available.
- Privilege Level: Guest
- Format: show ipsec connections access <P-1>

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.4 show ipsec connections certificates

IPsec connection certificates.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec connections certificates <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.5 show ipsec connections key-exchange

IPsec connection key exchange settings (IKE).

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec connections key-exchange <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.6 show ipsec connections data-exchange

IPsec connection data exchange settings.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec connections data-exchange <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.7 show ipsec connections status

IPsec connection status.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec connections status <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.8 show ipsec connections tunnels

IPsec connection tunnels.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec connections tunnels <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |

### 60.2.9 show ipsec traffic-selectors

Traffic selectors for a IPsec VPN connection.

- Mode: `Command is in all modes available.`
- Privilege Level: `Guest`
- Format: `show ipsec traffic-selectors <P-1> [<P-2>]`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..256 | VPN connection index. |
| P-2 | 1..16 | Index of the traffic selector (unique inside of a IPsec VPN connection). |

### 60.2.10 show ipsec certificate summary

Display a summary of the uploaded certificates and private keys.

- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show ipsec certificate summary`

### 60.2.11 show ipsec certificate details

Display the details about a specific certificate or private key.

- Mode: `Command is in all modes available.`
- Privilege Level: `Administrator`
- Format: `show ipsec certificate details <P-1>`

| Parameter | Value | Meaning |
|---|---|---|
| P-1 | 1..100 | Certificate Table Index. |

# 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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# B Readers' Comments

What is your opinion of this manual? We are constantly striving to provide as comprehensive a description of our product as possible, as well as important information to assist you in the operation of this product. Your comments and suggestions help us to further improve the quality of our documentation.

Your assessment of this manual:

| | Very Good | Good | Satisfactory | Mediocre | Poor |
|---|---|---|---|---|---|
| Precise description | O | O | O | O | O |
| Readability | O | O | O | O | O |
| Understandability | O | O | O | O | O |
| Examples | O | O | O | O | O |
| Structure | O | O | O | O | O |
| Comprehensive | O | O | O | O | O |
| Graphics | O | O | O | O | O |
| Drawings | O | O | O | O | O |
| Tables | O | O | O | O | O |

Did you discover any errors in this manual?
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Suggestions for improvement and additional information:

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