Switch

Command Line Interface

Reference Guide

SONICWALL®

Contents

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Introduction

The SonicWall Switch Command Line Interface (CLI) provides a concise and powerful way to configure SonicWall Switches without using the web-based management user interface.

You can use the CLI commands individually on the command line, or in scripts for automating configuration tasks.

This document contains an introduction to key conventions/keyboard shortcuts and the different CLI command modes, and a categorized list of the CLI commands for the Switch. Each command is described with the command objective, syntax, parameter descriptions and the command mode.

Topics:

Text Conventions

This topic describes the text formatting conventions used in this guide.

Bold text indicates a command executed by interacting with the user interface.

Italic text indicates the first occurrence of a new term, as well as a book title, and also emphasized text. Italics are sometimes used to represent user-specified information in this guide.

Items within angle brackets (“< >”) are required information.

Items within square brackets (“[ ]”) are optional information.

Items separated by a “pipe” (“|”) are options. You can select any of them.

ⓘ **NOTE:** Though a command string may be displayed on multiple lines in this guide, it must be entered on a single line, with no carriage returns except at the end of the complete command.

Key Conventions

KEYBOARD SHORTCUTS

- **Up Arrow / Down Arrow** - Displays the previously executed command.
- **Backspace / Ctrl + H** - Removes a single character.
- **TAB** - Completes a command without typing the full word.
- **Left Arrow / Right Arrow** - Traverses the current line.

OTHERS

- **?** - Help to list the available commands.
- **Q** - Exits and returns to the Switch prompt.
- **History** - Displays the command history list.

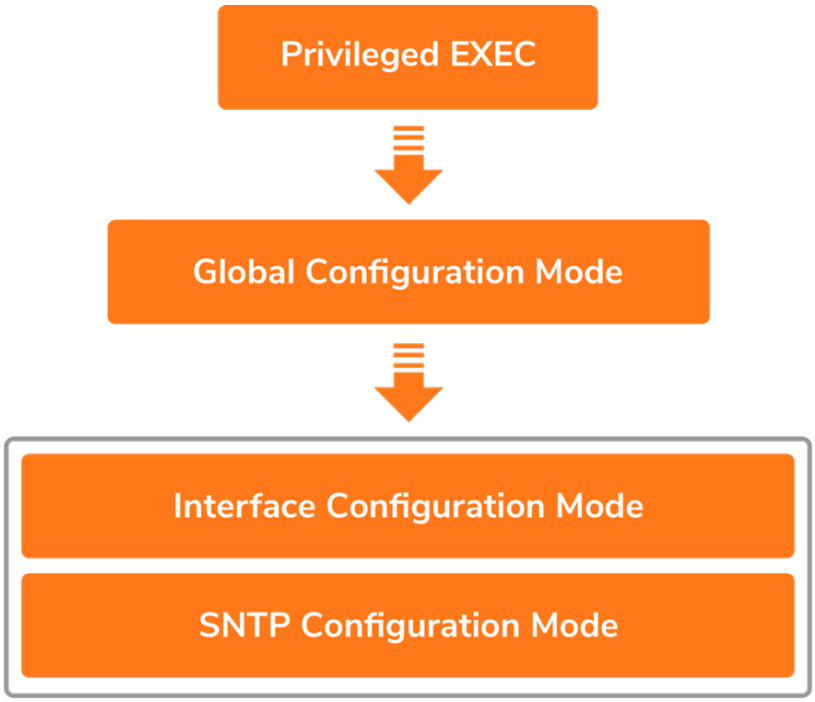
CLI Command Modes

The following table format lists the different CLI command modes. Depending on the CLI mode, the prompt will be specific.

Command Mode	Access Method	Prompt
Privileged EXEC	This is the initial mode to start a session	<*Switch Name*>#
Global Configuration	The EXEC mode command configure terminal is used to enter the Global Configuration mode.	<*Switch Name*> (config)#
Interface Configuration	The Global Configuration mode command interface <interfacetype><interfaceid> is used to enter the Interface configuration mode.	<*Switch Name*> (config-if)#
Interface Range Mode	The Global Configuration mode command *interface range* ({ <interfacetype><slot/port-port>} {vlan <vlan-id(1-4094)>- <vlan-id(2-4094)>}) is used to enter the Interface range mode.	<*Switch Name*> (config-if-range)#

Command Mode	Access Method	Prompt
SNTP Configuration	The SNTP Configuration mode command sntp is used to enter the SNTP configuration mode.	<*Switch Name*> (config-sntp)#
Config-VLAN	The Global configuration mode command vlan vlan-id is used to enter the Config-VLAN mode.	<*Switch Name*> (config-vlan)#
Line Configuration	The Line Configuration mode command *line cli* is used to enter the Line configuration mode.	<*Switch Name*> (config-line)#
IPV4 ACL Extended Access List Configuration	The IPV4 ACL Extended Access List configuration mode command ip *access-list* extended <*name*> is used to enter the IPV4 ACL Extended Access List configuration mode.	<*Switch Name*> (config-ext-nacl)#
MAC ACL Extended Access List Configuration	The MAC ACL Extended Access List configuration mode command *mac access-list* extended <*name*> is used to enter the MAC ACL Extended Access List configuration mode.	<*Switch Name*> (config-ext-macl)#
Policy Map Configuration Mode	The Policy Map configuration mode command class-policy <*name*> is used to enter the Policy Map configuration mode.	<*Switch Name*> (config-qc-ply)#
MSTP Configuration Mode	The MSTP Configuration mode command *spanning-tree mst configuration* is used to enter the MSTP configuration mode.	<*Switch Name*> (config-mst)#

Command Modes Path



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System Commands

help

Command Objective	This command displays a brief description for the given command.
Syntax	`help [command]`
Mode	All Modes

clear screen

Command Objective	This command clears all the contents from the screen.
Syntax	`clear screen`
Mode	All Modes

end

Command Objective	Exit from Configure mode.
Syntax	`end`
Mode	All Modes

logout

Command Objective	This command exits from Privileged EXEC/ User EXEC mode to ISS Login Prompt in case of console session. In case of a telnet session, this command terminates the session.
Syntax	`logout`
Mode	Privileged EXEC Mode

show privilege

Command Objective	Show current privilege level.
Syntax	`show privilege`
Mode	Privileged EXEC Mode

show cli

Command Objective	This command displays TTY line information such as EXEC timeout.
Syntax	`show cli`
Mode	Privileged EXEC Mode

exit

Command Objective	This command exits the current mode and reverts to the mode used prior to the current mode.
Syntax	`exit`
Mode	All Modes

configure terminal

Command Objective	This command enters to Global Configuration Mode which allows the user to execute all the commands that supports global configuration mode.
Syntax	`configure terminal`
Mode	Privileged EXEC Mode

listuser

Command Objective	This command lists all the default and newly created users, along with their permissible mode.
Syntax	`listuser`
Mode	Privileged EXEC Mode

show users

Command Objective	This command displays the information about the current user.
Syntax	`show users`
Mode	Privileged EXEC Mode

lock

Command Objective	This command locks the CLI console. It allows the user/system administrator to lock the console to prevent unauthorized users from gaining access to the CLI command shell. Enter the login password to release the console lock and access the CLI command shell.
Syntax	`lock`
Mode	Privileged EXEC Mode

show history

Command Objective	This command displays a list of recently executed commands.
Syntax	`show history`
Mode	Privileged EXEC Mode

username

Command Objective This command creates a user and sets the enable password for that user with the privilege level.

The no form of the command deletes a user and disables the enable password for that user.

Syntax

```
username <user-name> [password <passwd>] [privilege <1-15>]
```

```
no username < user-name >
```

Parameter Description

`<user-name>` - Specifies the login user name to be created.

`<passwd>` - Specifies the password to be entered by the user to login to the system. The size password entered must be a minimum of 4 and maximum of 32 characters containing atleast one uppercase, one lowercase, one number and one special character.

`privilege <1-15>` - Applies restriction to the user for accessing the CLI commands. This values ranges between 1 and 15. For Example, a user ID configured with privilege level as four can access only the commands having privilege ID lesser than or equal to four.

Mode Global Configuration Mode

line cli

Command Objective This command identifies a specific line for configuration and enters the line configuration mode and allows the user to execute all the commands that supports line configuration mode.

This command won't work when accessing the Switch console via ssh.

This command will work only when accessing the Switch console via Switch console port.

Syntax

```
line cli
```

Mode Global Configuration Mode

exec-timeout

Command Objective This command sets a time (in seconds) for EXEC line disconnection. This value ranges between 1 and 10000 minutes.

The no form of this command resets the EXEC timeout to its default value.

Syntax

```
exec-timeout <integer (1-10000)>
```

```
no exec-timeout
```

Mode Line Configuration Mode

ping

Command Objective This command sends echo messages. The Ping module is built based on the ICMP echo request and ICMP echo response messages. The network administrator uses this ping on a remote device to verify its presence. Ping involves sending ICMP echo messages repeated and measuring the time between transmission and reception of message. The output displays the time taken for each packet to be transmitted, number of packets transmitted, number of packets received and packet loss percentage.

Syntax

```
ping [ ip ] {IpAddress | hostname } [{repeat|count} packet_count
(1-10)] [size packet_size (8-5120)] [timeout time_out (1-100)]
```

Parameter Description

- `ip` - Configures the IP address of the node to be pinged.
- `ip_addr` - Configures the source IP address of the node to be pinged.
- `string` - Configures the name of the host.
- `repeat | count` - Configures the number of times the given node address is to be pinged.
- `size` - Configures the size of the data portion of the PING PDU.

Mode Privileged EXEC Mode

traceroute

Command Objective This command traces route to the destination.

Syntax

```
traceroute {<ip_addr>|<string>} [max-ttl <short (2-255)>]
```

Parameter Description

- `<ip_addr>` - Configure the destination IP address to which a route has to be traced.
- `<string>` - Configure the destination IP hostname to which a route has to be traced.
- `[max-ttl <short (2-255)>]` - Configures the maximum value of the TTL field to be filled up in the IP packets used for the trace route.

Mode Privileged EXEC Mode

clear counters

Command Objective This command clears all the current interface counters from the interface unless the optional arguments type and number are

specified to clear only a specific interface type (serial, Ethernet, Token Ring, and so on).

Syntax

```
clear counters [ <interface-type> <interface-id> ]
```

Parameter Description

- `<interface-type>` - Configures the specified type of interface.
- `<interface-id>` - Configures the IP interface configuration for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

jumbo-frame

Command Objective This command configures the maximum transmission unit frame size for all the frames transmitted and received on all the interfaces in a Switch. The size of the jumbo frame size can be increased using this command. The value ranges between 1522 and 10240. The no form of this command sets the maximum transmission unit to the default value in all interfaces. This value defines the largest PDU that can be passed by the interface without any need for fragmentation. This value is shown to the higher interface sub-layer and should not include size of the encapsulation or header added by the interface.

Syntax

```
jumbo-frame <frame-size(1522-10240)>
```

Mode Global Configuration Mode

interface range

Command Objective This command selects the range of physical interfaces and VLAN interfaces to be configured.

The no form of the command selects the range of VLAN interfaces to be removed.

Syntax

```
interface range ( { <interface-type> <slot/port-port>} {vlan
<vlan-id(1-4094)> - <vlan-id(2-4094)>})

no interface range vlan <vlan-id(1-4094)> - <vlan-id(2-4094)>
```

Parameter Description

- `<interface-type>` - Selects the range of the specified interface.
- `<slot/port-port>` - Selects the range of the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash.
- `vlan <vlan-id(1-4094)> - <vlan-id(2-4094)>` - Selects the range of the specified VLAN ID. This is a unique value that represents the specific VLAN created and activated. This value ranges between 1 and 4094.

Mode Global Configuration Mode

configure terminal

Command Objective This command enters the configuration mode. Configuration from memory or network is not supported when entered into the configuration mode using this command.

Syntax

```
configure terminal
```

Mode Privileged EXEC Mode

mac-address-table static unicast

Command Objective

This command configures a static unicast MAC address in the forwarding database.

The no form of the command deletes a configured static Unicast MAC address from the forwarding database.

Syntax

```
mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan

<vlan-id > interface ([<interface-type> <0/a-b, 0/c, ...>]
[<interface-type> <0/a-b, 0/c, ...>] [port-channel <a,b,c-d>])

no mac-address-table static unicast <aa:aa:aa:aa:aa:aa> vlan

<vlan-id >
```

Parameter Description

- `<aa:aa:aa:aa:aa:aa>` - Configures the static unicast destination MAC address. The received packets having the specified MAC address are processed.
- `vlan <vlan-id>` - Configures the static unicast destination MAC address for the specified VLAN. This value ranges between 1 and 4094.
  - `<vlan –id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- `interface` - Configures the member ports interface type and ID. The details to be provided are:
  - `<interface-type>` - Configures the member ports for the specified type of interface. The interface can be:
    - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
    - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
  - `<0/a-b, 0/c, ...>` - Configures the member ports for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. Port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.

Mode

Global Configuration Mode

mac-address-table aging-time

Command Objective This command configures the timeout period (in seconds) for aging out dynamically learned forwarding information entry and static entry in the MAC address table. That is, the entry is deleted once the aging timer expires. High value for the aging time helps to record dynamic entries for a longer time, if traffic is not frequent. This reduces the possibility of flooding.

The no form of the command resets the maximum age of an entry in the MAC address table to its default value.

Syntax

```
mac-address-table aging-time <10-630 seconds>
```

```
no mac-address-table aging-time
```

Mode Global Configuration Mode/ Switch Configuration Mode

set switch-name

Command Objective This command sets the name of the Switch.

Syntax

```
set switch-name <switchname>
```

Mode Global Configuration Mode

ip telnet server

Command Objective This command enables the telnet service in the system. The no form of this command disables the telnet service.

Syntax

```
ip telnet server
```

```
no ip telnet server
```

Mode Global Configuration Mode

copy startup-config

Command Objective This command copies a file from a source remote site /flash to a destination remote site/flash. The entire copying process takes several minutes and differs from protocol to protocol and from network to network.

Syntax

```
copy startup-config { tftp://ip-address/filename }
```

Parameter Description

- `tftp://ip-address/filename` - Configures the TFTP details for taking back up of initial configuration in TFTP server.
  - `ip-address` - The IP address or host name of the server.
  - `filename` - The name of the file in which the initial configuration should be stored. Filenames and directory names are case sensitive

Mode Privileged EXEC Mode

copy

Command Objective	This command copies the configuration from a remote site to flash.
Syntax	`copy { tftp://ip-address/filename startup-config}`
Parameter Description	• `tftp://ip-address/filename startup-config` - Configures the address from which the file is to be copied and the file name from which configuration is to be copied. This option configures the TFTP server details Filenames and directory names are case sensitive
Mode	Privileged EXEC Mode

save

Command Objective	This command copies variables from the running configuration to the startup configuration file in NVRAM, where the running- config is the current configuration in the router and the startup config is the configuration that is loaded when the Switch boots up.
Syntax	`save`
Mode	Privileged EXEC Mode

copy logs

Command Objective	This command writes the system logs to a remote site.
Syntax	`copy logs { tftp://ip-address/filename }`
Parameter Description	• `tftp://ip-address/filename startup-config` - Configures the address from which the file is to be copied and the file name from which configuration is to be copied. This option configures the TFTP server details Filenames and directory names are case sensitive
Mode	Privileged EXEC Mode

clock set

Command Objective This command manages the system clock.

Syntax

- `clock set hh:mm:ss <day (1-31)>`
- `{january|february|march|april|may|june|july|august|septemb er|october|november|december} <year (2000 - 2035)>`

Parameter Description

- `hh:mm:ss` - Sets the current time. The format is hour, minutes and seconds.
  - `<day (1-31)>` - Sets the current day. It ranges between 1 and 31.
  - `january` - Sets the month as January.
  - `february` - Sets the month as February
  - `march` - Sets the month as march
  - `april` - Sets the month as april
  - `may` - Sets the month as may
  - `june` - Sets the month as June
  - `july` - Sets the month as July
  - `august` - Sets the month as August
  - `september` - Sets the month as September
  - `october` - Sets the month as October
  - `november` - Sets the month as November
  - `december` - Sets the month as December
  - `<year (2000 - 2035)>` - Sets the year. It ranges between 2000 and 2035

Mode Global Configuration Mode

show clock

Command Objective This command displays the system date and time.

Syntax `show clock`

Mode Privileged EXEC Mode

show jumbo-frame

Command Objective This command displays the maximum transmission unit frame size for all the frames transmitted and received on all the interfaces in a Switch.

Syntax `show jumbo-frame`

Mode Privileged EXEC Mode

reboot

Command Objective This command restarts the Switch.

Syntax `reboot`

Mode Privileged EXEC Mode

restore-defaults

Command Objective This command restore default configuration.

Syntax `restore-defaults`

Mode Privileged EXEC Mode

show telnet server

Command Objective This command displays the telnet server status.

Syntax `show telnet server`

Mode Privileged EXEC Mode

port speed - duplex

Command Objective This command configures the speed and duplex operation.

Syntax

- `speed { 10 | 100 | 1000 | 10000 } duplex { full | half }`

Parameter Description

- `10` - Port runs at 10Mbps
- `100` - Port runs at 100Mbps
- `1000` - Port runs at 1000Mbps
- `10000` - Port runs at 10000Mbps
- `full` - Port is in full-duplex mode, that is data simultaneously communicates in both directions.
- `half` - Port is in half-duplex mode, that is data can communicate in both directions, but only in one direction at a time.

Mode Interface Configuration

negotiation

Command Objective This command enables auto-negotiation on the interface.

The no form of the command disables auto-negotiation on the interface.

The port in which auto-negotiation is enabled, negotiates with the other end for port properties like speed, duplexity and so one. The normal port uses the port property values configured by the administrator.

Syntax

`negotiation`

`no negotiation`

Mode Interface Configuration

port-isolation

Command Objective This command set the status of the traffic to be allowed in these configured egress ports when the ingress is this interface.

Syntax `port-isolation {enable|disable}`

Parameter Description

- `enabled` - Enables the Port Isolation rule in this ingress interface.
- `disabled` - Disables the Port Isolation rule in this ingress interface.

Mode Interface Configuration

show port-isolation status

Command Objective	This command displays the Port Isolation table.
Syntax	`show port-isolation status`
Mode	Privileged EXEC Mode

clock utc-offset

Command Objective	This command sets the system time zone with respect to UTC. The no form of command resets the system time zone to GMT.
Syntax	`clock utc-offset <UTC-offset value as (+HH:MM /-HH:MM)(+00:00 to +14:00)/ (-00:00 to -12:00)> Eg: +05:30`

Parameter Description	• `+/-` - Sets the client time zone as after or before UTC. Plus indicates forward time zone and minus indicates backward time zone.
	• `UTC- offset value as` - Sets the UTC offset value in hours.
	  • +00:00 to +14:00
	  • -00:00 to -12:00

Mode	Global Configuration Mode

show clock properties

Command Objective	This command displays the PTP clock properties.
Syntax	`show clock properties`
Mode	Privileged EXEC Mode

interface

Command Objective This command allows to configure interface such as VLAN.

Syntax

```
interface {vlan < vlan-id > [switch <string(32)>] | port-channel <integer (1-8)> | <iftype> <ifnum>} no interface {vlan < vlan-id > [switch <string(32)>] | port- channel <integer (1-8)> | <iftype> <ifnum>}
```

Parameter Description

- `vlan <vlan-id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.
- `switch<switch-name>` - Configures interface for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature. This feature has been included to adhere to the Industry Standard CLI syntax.
- `port-channel<port-channel-id (1-8)>` - Configures the port to be used by the host to configure the router. This value ranges between 1 and 8. The port channel identifier can be created or port channel related configuration can done, only if the LA feature is enabled in the Switch.
- `<interface-type>` - Configures the specified type of interface
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.

Mode Global Configuration Mode

ip address

Command Objective This command sets the IP address for an interface.

Syntax

```
ip address <ucast_addr> <ip_mask>
```

```
no ip address <ucast_addr>
```

Parameter Description

- `ucast_addr` - Sets the IP address for an interface. If the network in which the Switch is implemented contains a server such as DHCP server, dynamically allocating IP address, the configured IP address should not be within the range of the addresses that will be allocated by the server to the other Switches. This precaution avoids creation of IP address conflicts between the Switches.
- `ip_mask` - Sets the subnet mask for the configured IP address. The configured subnet mask should be in the same subnet of the network in which the Switch is placed.

Mode Interface Configuration Mode

This command is applicable in VLAN Interface Mode / OOB Interface Mode.

ip address dhcp/bootp

Command Objective This command sets the DHCP/BOOTP IP address for an interface.

Syntax

```
ip address dhcp
```

```
no ip address
```

Parameter Description

- `dhcp` - Get IP by using DHCP protocol.
- `bootp` - Get IP by using BOOTP protocol.

Mode Interface Configuration Mode

shutdown

Command Objective Set the AdminStatus of Interface down/up.

Syntax

```
shutdown
```

```
no shutdown
```

Mode Interface Configuration Mode

description

Command Objective Descriptions about the interface.

Syntax

```
description <description of this interface>
```

```
no description
```

Mode Interface Configuration Mode

show interface port-security

Command Objective This command shows the maximum number of learning address and lock mode.

Syntax

```
show interface port-security [<iftype> <ifnum>]
```

Parameter Description

- `<interface-type>` - Displays the IP interface configuration for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.

Mode Privileged EXEC Mode

show interface cable-diag

Command Objective Used to diagnose the copper cable. If there is an error on the cable, it can determine the type of error and the position where the error occurred.

Syntax

```
show interface cable-diag Gigabitethernet [<iftype> <ifnum>]
```

Parameter Description

- `OK` - This pair has been connected to partner network device and the link is up.
- `OPEN` - This pair is left open.
- `SHORT` - This pair has been shorted between two lines of its own.
- `Unknown` - The last diagnosis do not obtain the cable' status, please try it again.

Mode Privileged EXEC Mode

show interfaces

Command Objective This command displays the interface status and configuration.

Syntax

```
show interfaces [{ [<interface-type> <interface-id>]
[{ description | storm-control | flowcontrol | capabilities |
status | port-security-state | rate-limit }]| {vlan <vlan-id>
[{switch <switch-name>}]}
```

Parameter Description

- `<interface-type>` - Displays the interface status and configuration for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
- `<interface-id>` - Displays the interface status and configuration for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.
- `Description` - Displays the interface description.
- `storm-control` - Displays the broadcast, multicast, and unicast storm suppression levels for the specified interface
- `flowcontrol` - Displays the flow control related statistics information for the specified interface.
- `capabilities` - Displays the interface type, interface speed, duplex operation and flowcontrol status for the specified interface.
- `status` - Displays the status, duplex details, speed and negotiation mode of the specified interface.
- `port-security-state` - Displays the state of the port security option.
- `vlan <vlan-id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.
- `switch<switch-name>` - Configures interface for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature. This feature has been included to adhere to the Industry Standard CLI syntax.

Mode Privileged EXEC Mode

show interfaces - counters

Command Objective This command displays the interface statistics for each port.

Syntax `show interfaces {counters | { <interface-type> <interface-id> counters }}`

Parameter Description

- `counters` - Displays the interface statistics for all the available interfaces.
- `<interface-type>` - Displays the IP interface configuration for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the IP interface configuration for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

clear interfaces - counters

Command Objective This command clears all the current interface counters from the interface unless the optional arguments type and number are specified to clear only a specific interface type (serial, Ethernet, Token Ring, and so on).

Syntax `clear interfaces [ <interface-type> <interface-id> ] counters`

Parameter Description

- `<interface-type>` - Configures the specified type of interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the IP interface configuration for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash.

  For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

show ip interface

Command Objective This command displays the IP interface configuration.

Syntax

```
show ip interface [{[Vlan <vlan-id(1-4094)> | [<interface-type><interface-id>]
```

Parameter Description

- `Vlan<vlan-id(1-4094)>` - Displays the IP interface configuration for the
- The specified VLAN ID is a unique value that represents the specific VLAN created. This value ranges between 1 and 4094.
- `<interface-type>` - Displays the IP interface configuration for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the IP interface configuration for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

show flow-control

Command Objective This command displays the flow-control information.

Syntax

```
show flow-control [ interface <interface-type> <interface-id>]
```

Parameter Description

- `<interface-type>` - Displays the flow-control information for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the flow-control information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

snmp trap link-status

Command Objective This command enables/disable trap generation on the interface. The interface generates a linkUp or linkDown trap. The linkUp trap denotes that the communication link is available and ready for traffic flow. The linkDown trap denotes that the communication link failed and is not ready for traffic flow.

Syntax

```
snmp trap link-status

no snmp trap link-status
```

Mode Interface Configuration Mode

flowcontrol

Command Objective	This command is used to set the send or receive flow-control value for an interface.
Syntax	`flowcontrol { on | off }`
Parameter Description	• `on` - If used with receive allows an interface to operate with the attached device to send flow control packets. If used with send the interface sends flowcontrol packets to a remote device if the device supports it • `off` - Turns-off the attached devices (when used with receive) or the local ports (when used with send) ability to send flow-control packets to an interface or to a remote device respectively.
Mode	Interface Configuration Mode

port-security

Command Objective	This command configures the number of learning address on certain interface port.

Syntax	`port-security <limit-size(1-256)>`
	
	`no port-security`

Parameter Description	• `< limit-size(1-256)>` - Range is 1 to 256.
Mode	Interface Configuration Mode

3

ACL Commands

Ip Access-list Extend

Command Objective This command creates IP ACLs and enters the IP Access-list configuration mode.

The no form of the command deletes the IP access-list.

Syntax

```
ip access-list extended <string(31)>
```

```
no ip access-list extended <string(31)>
```

Parameter Description

- `<string(31)>` - Configures the extended access-list name.

Mode Global Configuration Mode

Mac Access-list Extend

Command Objective This command creates mac ACLs and enters the mac Access-list configuration mode.

The no form of the command deletes the mac access-list.

Syntax

```
mac access-list extended <string(31)>
```

```
no mac access-list extended <string(31)>
```

Parameter Description

- `<string(31)>` - Configures the access-list name.

Mode Global Configuration Mode

Permit- Ip/ospf/pim/protocol Type

Command Objective

This command allows traffic for a particular protocol packet if the conditions defined in the permit statement are matched.

Syntax

```
permit { ip | ospf | pim | <short (1-255)>} { any| host <src-ip-address>|<src-ip-address> <mask>} { any|host <dest-ip-address>|<dest-ip-address> <mask> } ace-priority <integer (1-2147483647)> [ dscp <short (0-63)>]
```

Parameter Description

- `ip| ospf|pim|<protocol-type (1-255)>` - Type of protocol for the packet. It can also be a protocol number.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV4 ACL Extended Access List Configuration Mode

Deny- Ip/ospf/pim/protocol Type

Command Objective

This command denies traffic for a particular protocol packet if the conditions defined in the deny statement are matched.

Syntax

```
deny { ip | ospf | pim | <short (1-255)>} { any| host <src-ip-address>|<src-ip-address> <mask> } { any|host <dest-ip-address>|<dest-ip-address> <mask> } ace-priority <integer (1-2147483647)> [ dscp <short (0-63)>]
```

Parameter Description

- `ip| ospf|pim|<protocol-type (1-255)>` - Type of protocol for the packet. It can also be a protocol number.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV4 ACL Extended Access List Configuration Mode

Permit Tcp

Command Objective

This command specifies the TCP packets to be forwarded based on the associated parameters.

Syntax

```
permit tcp { any| host <src-ip-address>|<src-ip-address>
<mask>} [eq <short (1-65535)>] { any|host <dest-ip-
address>|<dest-ip-address> <mask> } [eq <short (1-65535)>] ace-
priority <integer (1-2147483647)> [{ack | non_ack}] [{rst | non_
rst}] [{psh | non_psh}] [{urg | non_urg}] [{syn | non_syn}]
[{fin | non_fin}] [dscp <short (0-63)>]
```

Parameter Description

- `tcp` - Transport Control Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any|host <dest-ip-address>|<dest-ip-address> <mask> –`
- Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ack | non_ack` - TCP ACK bit to be checked against the packet.
- `rst | non_rst` - TCP RST bit to be checked against the packet.
- `psh | non_psh` - TCP PSH bit to be checked against the packet.
- `urg | non_urg` - TCP URG bit to be checked against the packet.
- `syn | non_syn` - TCP SYN bit to be checked against the packet.
- `fin | non_fin` - TCP FIN bit to be checked against the packet.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV4 ACL Extended Access List Configuration Mode

Deny Tcp

Command Objective

This command specifies the TCP packets to be rejected based on the associated parameters.

Syntax

```
deny tcp { any| host <src-ip-address>|<src-ip-address> <mask>}
[eq <short (1-65535)>] { any|host <dest-ip-address>|<dest-ip-
address> <mask> } [eq <short (1-65535)>] ace-priority <integer
(1-2147483647)> [{ack | non_ack}] [{rst | non_rst}] [{psh | non_
psh}] [{urg | non_urg}] [{syn | non_syn}] [{fin | non_fin}]
[dscp <short (0-63)>]
```

Parameter Description

- `tcp` - Transport Control Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ack | non_ack` - TCP ACK bit to be checked against the packet.
- `rst | non_rst` - TCP RST bit to be checked against the packet.
- `psh | non_psh` - TCP PSH bit to be checked against the packet.
- `urg | non_urg` - TCP URG bit to be checked against the packet.
- `syn | non_syn` - TCP SYN bit to be checked against the packet.
- `fin | non_fin` - TCP FIN bit to be checked against the packet.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV4 ACL Extended Access List Configuration Mode

Permit Udp

Command Objective This command specifies the UDP packets to be forwarded based on the associated parameters.

Syntax

```
permit udp { any| host <src-ip-address>|<src-ip-address>
<mask> } [eq <short (1-65535)> ] { any|host <dest-ip-
address>|<dest-ip-address> <mask> } [ eq <short (1-65535)> ]
ace-priority <integer (1-2147483647)> [ dscp <short (0-63)>]
```

Parameter Description

- `udp` - User Datagram Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV4 ACL Extended Access List Configuration Mode

Deny Udp

Command Objective This command specifies the UDP packets to be rejected based on the associated parameters.

Syntax

```
deny udp { any| host <src-ip-address>|<src-ip-address>
<mask> } [eq <short (1-65535)> ] { any|host <dest-ip-
address>|<dest-ip-address> <mask> } [ eq <short (1-65535)> ]
ace-priority <integer (1-2147483647)> [ dscp <short (0-63)>]
```

Parameter Description

- `udp` - User Datagram Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV4 ACL Extended Access List Configuration Mode

Permit Icmp

Command Objective

This command specifies the ICMP packets to be forwarded based on the IP address and the associated parameters.

Syntax

```
permit icmp { any| host <src-ip-address>|<src-ip-address>
<mask>} { any|host <dest-ip-address>|<dest-ip-address>
<mask> } [type <short (0-255)>] [code <short (0-255)>] ace-
priority <integer (1-2147483647)> [dscp <integer (0-63)>]
```

Parameter Description

- `icmp` - Internet Control Message Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `type <short (0-255)>` - message type
- `code <short (0-255)>` - message code
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV4 ACL Extended Access List Configuration Mode

Deny Icmp

Command Objective This command specifies the ICMP packets to be rejected based on the IP address and associated parameters.

Syntax

```
deny icmp { any| host <src-ip-address>|<src-ip-address>
<mask>} { any|host <dest-ip-address>|<dest-ip-address>
<mask> } [type <short (0-255)>] [code <short (0-255)>] ace-
priority <integer (1-2147483647)> [dscp <integer (0-63)>]
```

Parameter Description

- `icmp` - Internet Control Message Protocol.
- `any| host <src-ip-address>|<src-ip-address> <mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any|host <dest-ip-address>|<dest-ip-address> <mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address
- `type <short (0-255)>` - message type
- `code <short (0-255)>` - message code
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV4 ACL Extended Access List Configuration Mode

No Ace-priority

Command Objective Delete an ace entry.

Syntax

```
no ace-priority <integer (1-2147483647)>
```

Parameter Description

- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.

Mode IPV4 ACL Extended Access List Configuration Mode

No Ace-priority

Command Objective Delete an ace entry.

Syntax

```
no ace-priority <integer (1-2147483647)>
```

Parameter Description

- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.

Mode IPV4 ACL Extended Access List Configuration Mode

Permit Ipv6

Command Objective This command specifies IPv6 packets to be forwarded based on protocol and associated parameters.

Syntax

```
permit ipv6 {any | host <ip6_addr> <integer(0-128)> } { any | host <ip6_addr> <integer(0-128)> } ace-priority <integer (1-2147483647)> [dscp <short(0-63)>]
```

Parameter Description

- `ipv6` - IPv6 protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV6 ACL Extended Access List Configuration Mode

Deny Ipv6

Command Objective This command specifies IPv6 packets to be forwarded based on protocol and associated parameters.

Syntax

```
deny ipv6 {any | host <ip6_addr> <integer(0-128)> } { any | host <ip6_addr> <integer(0-128)> } ace-priority <integer (1-2147483647)> [dscp <short(0-63)>]
```

Parameter Description

- `ipv6` – IPv6 protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV6 ACL Extended Access List Configuration Mode

Permit Tcp

Command Objective

This command specifies the IPv6 TCP packets to be forwarded based on the associated parameters.

Syntax

```
permit tcp {any | host <ip6_addr> <short(0-128)>}[eq <short (1-65535)>] {any | host <ip6_addr> <short(0-128)>} [eq <short (1-65535)>] {ace-priority <integer (1- 2147483647)>} [{ack | non_ack}] [{rst | non_rst}] [{psh | non_psh}] [{urg | non_urg}] [{syn | non_syn}] [{fin | non_fin}] [dscp <short (0-63)>]
```

Parameter Description

- `tcp` - Transport Control Protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ack | non_ack` - TCP ACK bit to be checked against the packet.
- `rst | non_rst` - TCP RST bit to be checked against the packet.
- `psh | non_psh` - TCP PSH bit to be checked against the packet.
- `urg | non_urg` - TCP URG bit to be checked against the packet.
- `syn | non_syn` - TCP SYN bit to be checked against the packet.
- `fin | non_fin` - TCP FIN bit to be checked against the packet.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode

IPV6 ACL Extended Access List Configuration Mode

Deny Tcp

Command Objective This command specifies the IPv6 TCP packets to be forwarded based on the associated parameters.

Syntax

```
deny tcp {any | host <ip6_addr> <short(0-128)>}[eq <short (1-65535)>] {any | host <ip6_addr> <short(0-128)>} [eq <short (1-65535)>] {ace-priority <integer (1-2147483647)>} [{ack | non_ack}] [{rst | non_rst}] [{psh | non_psh}] [{urg | non_urg}] [{syn | non_syn}] [{fin | non_fin}] [dscp <short (0-63)>]
```

Parameter Description

- `tcp` - Transport Control Protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ack | non_ack` - TCP ACK bit to be checked against the packet.
- `rst | non_rst` - TCP RST bit to be checked against the packet.
- `psh | non_psh` - TCP PSH bit to be checked against the packet.
- `urg | non_urg` - TCP URG bit to be checked against the packet.
- `syn | non_syn` - TCP SYN bit to be checked against the packet.
- `fin | non_fin` - TCP FIN bit to be checked against the packet.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV6 ACL Extended Access List Configuration Mode

Permit Udp

Command Objective This command specifies the IPv6 UDP packets to be forwarded based on the associated parameters.

Syntax

```
permit udp {any | host <ip6_addr> <short(0-128)>} [eq <short (1-65535)>] {any | host <ip6_addr> <short(0-128)>} [ eq <short (1-65535)> ] ace-priority <integer (1- 2147483647)> [dscp <short (0-63)>]
```

Parameter Description

- `udp` - User Datagram Protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV6 ACL Extended Access List Configuration Mode

Deny Udp

Command Objective This command specifies the IPv6 UDP packets to be forwarded based on the associated parameters.

Syntax

```
deny udp {any | host <ip6_addr> <short(0-128)>} [eq <short (1-65535)>] {any | host <ip6_addr> <short(0-128)>} [ eq
<short (1-65535)> ] ace-priority <integer (1-2147483647)>
[dscp <short (0-63)>]
```

Parameter Description

- `udp` - User Datagram Protocol.
- `any | host <ip6_addr> <integer(0-128)>` - Source address of the host / any host
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip6_addr> <integer(0-128)>` - Destination address of the host / any host.
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.

Mode IPV6 ACL Extended Access List Configuration Mode

Permit Mac

Command Objective

This command specifies the packets to be forwarded based on the MAC address and the associated parameters, that is, this command allows non-IP traffic to be forwarded if the conditions are matched.

Syntax

```
permit { any | <src-mac-address > } { any | host
<mac_addr> } {ace-priority <integer (1-2147483647)>}
[ ethertype <integer (1-65535)> ] [ vlan <integer (1-4094)>] [
vlan-priority <short (0-7)> ]
```

Parameter Description

- `any | host <src-mac-address >` - Source MAC address to be matched with the packet
- `any | host <dest-mac-address >` - Destination MAC address to be matched with the packet
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ethertype <integer (1-65535)>` - Specifies the non-IP protocol type to be filtered.
- `vlan <integer (1-4094)>` - VLAN value to match against incoming packets.
- `vlan-priority <short (0-7)>` - VLAN priority value to match against incoming packets.

Mode

MAC ACL Extended Access List Configuration Mode

Deny Mac

Command Objective This command specifies the packets to be rejected based on the MAC address and the associated parameters.

Syntax

```
deny { any | <src-mac-address > } { any | host
<mac_addr> } {ace-priority <integer (1-2147483647)>}
[ ethertype <integer (1536-65535)> ] [ vlan <integer (1-4094)>]
[ vlan-priority <short (0-7)> ]
```

Parameter Description

- `any | host <src-mac-address >` - Source MAC address to be matched with the packet
- `any | host <dest-mac-address >` - Destination MAC address to be matched with the packet
- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.
- `ethertype <integer (1536-65535)>` - Specifies the non-IP protocol type to be filtered.
- `vlan <integer (1-4094)>` - VLAN value to match against incoming packets.
- `vlan-priority <short (0-7)>` - VLAN priority value to match against incoming packets.

Mode MAC ACL Extended Access List Configuration Mode

No Ace-priority

Command Objective Delete an ace entry.

Syntax

```
no ace-priority <integer (1-2147483647)>
```

Parameter Description

- `ace-priority <integer (1-2147483647)>` - The priority of the filter is used to decide which filter rule is applicable when the packet matches with more than one filter rules.

Mode MAC ACL Extended Access List Configuration Mode

Ip Access-group

Command Objective This command enables access control for the packets on the interface.

The no form of this command removes all access groups or the specified access group from the interface.

Syntax

```
ip access-group <string (31)> in
no ip access-group [<string(31)>] in
```

Parameter Description

- `<string(31)>` - IP access control list name.

Mode Interface Configuration Mode

Mac Access-group

Command Objective	This command applies a MAC access control list (ACL) to a Layer 2 interface. The no form of this command can be used to remove the MAC ACLs from the interface.
Syntax	`mac access-group <string (31)> in` `no mac access-group [<string(31)>] in`
Parameter Description	• `<string(31)>` - MAC access control list name.
Mode	Interface Configuration Mode

Show Access-lists

Command Objective	This command displays the access lists configuration.
Syntax	`show access-lists [{ip | mac | ipv6 } [<string(31)>] ]`
Parameter Description	• `ip` - IP Access List • `mac` - MAC Access List • `ipv6` - IPv6 Access List • `<string(31)>` - Name of access list
Mode	Privileged EXEC Mode

4

Domain Name Server (DNS) Commands

Domain Name-server

Command Objective This command configures the IP address for the domain name server.

The no form of the command disables the IP address configured for the domain name server.

Syntax

```
domain name-server ipv4 <ucast_addr>
```

```
no domain name-server ipv4 <ucast_addr>
```

Parameter Description

- `ipv4 <ucast_addr>` - Sets the IP address for the domain name server in IPv4 address format.

Mode Global Configuration Mode

Show Ip Dns Name-server

Command Objective This command displays the DNS name servers information.

Syntax

```
show ip dns name-server
```

Mode Privileged EXEC Mode

5

Energy Efficient Ethernet (EEE) Commands

eee

Command Objective This command enables/disables Energy Efficient Ethernet on the specified port.

The no form of the command disable Energy Efficient Ethernet on the specified port.

Syntax

```
eee
```

```
no eee
```

Mode Interface Configuration Mode

show eee

Command Objective This command enables/disables Energy Efficient Ethernet on the specified port.

The no form of the command disable Energy Efficient Ethernet on the specified port.

Syntax

```
eee
```

```
no eee
```

Mode Interface Configuration Mode

6

Internet Group Management Protocol (IGMP) Commands

shutdown snooping

Command Objective This command shuts down the complete snooping configuration in the Switch. When the user does not require the IGMP snooping module to be running, it can be shut down. When shut down, all resources acquired by the Snooping Module are released to the system. For the IGS feature to be functional on the Switch, the **system-control** status must be set as **start** and the **state** must be **enabled**.

The no form of the command starts and enables snooping in the Switch.

ⓘ **NOTE:** Snooping cannot be started in the Switch if the base bridge mode is configured as transparent bridging.

Syntax

```
shutdown snooping

no shutdown snooping
```

Mode Global Configuration Mode

snooping multicast-forwarding-mode

Command Objective This command specifies the snooping multicast forwarding mode (IP based or MAC based).

Syntax

```
snooping multicast-forwarding-mode {ip | mac}
```

Parameter Description

- `ip` - Configures the multicast forwarding mode as IP Address based. The PIM queries the IGS module to obtain the Portlist.
- `mac` - Configures the multicast forwarding mode as MAC Address based. The PIM queries the VLAN to obtain the Portlist.

Mode Global Configuration Mode

ip igmp snooping

Command Objective

This command enables IGMP snooping in the Switch, globally or on a specific VLAN. When snooping is enabled in a Switch or interface, it learns the hosts intention to listen to a specific multicast address. When the Switch receives any packet from the specified multicast address, it forwards the packet to the host listening for that address. Broadcasting is avoided to save bandwidth. When IGMP snooping is enabled globally, it is enabled in all the existing VLAN interfaces.

The no form of the command disables IGMP snooping in the Switch, globally or on a specific VLAN. When IGMP snooping is disabled globally, it is disabled in all the existing VLAN interfaces.

Syntax

Global Configuration Mode

```
ip igmp snooping [vlan < vlan-id >]
```

```
no ip igmp snooping [vlan < vlan-id >]
```

Config-VLAN Mode

```
ip igmp snooping
```

```
no ip igmp snooping
```

Parameter Description

- `<vlan -id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.

Mode

Global Configuration Mode / Config - VLAN Mode

ip igmp querier-timeout

Command Objective

This command sets the IGMP snooping router port purge time- out interval. Snooping learns the available router ports and initiates router port purge time-out timer for each learnt router port. The routers send control messages to the ports. If the router ports receive such control messages, the timer is restarted. If no message is received by the router ports before the timer expires, the router port entry is purged. The purge time-out value ranges between 60 and 600 seconds.

This command is a standardized implementation of the existing command; ip igmp snooping mrouter-time-out. It operates similar to the existing command.

Syntax

```
ip igmp querier-timeout <(60 - 600) seconds>
```

Mode

Global Configuration Mode

ip igmp snooping vlan - immediate leave

Command Objective

This command enables fast leave processing and IGMP snooping for a specific VLAN, It enables IGMP snooping only for the specific VLAN when IGMP snooping is globally disabled. When the fast leave feature is enabled, port information is removed from a multicast group entry immediately after fast leave message is received. The ID of the VLAN ranges between 1 and 4094.

The no form of the command disables fast leave processing for a specific VLAN.

This command is a standardized implementation of the existing command; ip igmp snooping fast-leave. It operates similar to the existing command.

NOTE: Fast leave configurations done in a VLAN when IGMP snooping is disabled in a VLAN, will be applied only when IGMP snooping is enabled in the VLAN.

Syntax

```
ip igmp snooping vlan <vlanid(1-4094)> immediate-leave

no ip igmp snooping vlan <vlanid(1-4094)> immediate-leave
```

Mode

Global Configuration Mode

ip igmp snooping vlan mrouter

Command Objective

This command enables IGMP snooping and configures a list of multicast router ports for a specific VLAN, if IGMP snooping is globally enabled. This will enable IGMP snooping only for the specific VLAN, if IGMP snooping is globally disabled.

Any IGMP message received on a Switch is forwarded only on the router-ports and not on host ports. In this manner, the IGMP

snooping functionality avoids flooding of IGMP query messages from the host to the entire network.

The no form of the command deletes the statically configured router ports for a VLAN.

This command is a standardized implementation of the existing command; ip igmp snooping mrouter. It operates similar to the existing command.

ⓘ **NOTE:** The list of multicast router ports configured while IGMP snooping is disabled in the VLAN is applied only when the IGMP snooping is enabled in the VLAN.

Syntax

```
ip igmp snooping vlan <vlanid (1-4094)> mrouter < interface-type > <0/a-b, 0/c, ...>

no ip igmp snooping vlan <vlanid (1-4094)> mrouter < interface-type > <0/a-b, 0/c, ...>
```

Parameter Description

- `<vlanid (1-4094)>` - Configures the VLAN for which the list of multicast router ports should be configured statically. This is a unique value that represents the specific L3 VLAN created. An L3 VLAN interface is a VLAN that is mapped to an IP interface and assigned an IP address. This value ranges between 1 and 4094.
- `< interface-type >` - Configures the list of multicast router ports for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
- `<0/a-b, 0/c, ...>` - Sets the list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash. Port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.

Mode

Global Configuration Mode

ip igmp snooping report-suppression interval

Command Objective This command sets the IGMP snooping report-suppression time interval. The Switch forwards IGMPv2 report message to the multicast group. A timer is started immediately after forwarding the report message and runs for set period of time. During this interval the Switch does not forward another IGMPv2 report message addressed to the same multicast group to the router ports.

The no form of the command sets the IGMP snooping report- suppression interval time to the default value.

ⓘ **NOTE:** The ip igmp snooping report-suppression-interval is used only when the proxy and proxy-reporting are disabled.

Syntax

```
ip igmp snooping report-suppression-interval <(1 – 25) seconds>

no ip igmp snooping report-suppression-interval
```

Mode Global Configuration Mode

ip igmp snooping group-query-interval

Command Objective This command sets the time interval after which the Switch sends a group specific query to find out if there are any interested receivers in the group when it receives a leave message. If it does not receive a response from the group, the port is removed from the group membership information in the forwarding database. This value ranges between 2 and 5.

The no form of the commands sets the group specific query interval time to default value.

Syntax

```
ip igmp snooping group-query-interval <2-5) seconds>

no ip igmp snooping group-query-interval
```

Mode Global Configuration Mode

ip igmp snooping version

Command Objective This command configures the operating version of the IGMP snooping Switch for a specific VLAN. The version can be set manually to execute condition specific commands.

Syntax

```
ip igmp snooping version { v1 |v2 | v3}
```

Parameter Description

- `v1` - Configures the version as IGMP snooping Version 1.
- `v2` - Configures the version IGMP snooping Version 2.
- `v3` - Configures the version IGMP snooping Version 3.

Mode Config-VLAN Mode

ip igmp snooping fast-leave

Command Objective

This command enables fast leave processing and IGMP snooping for a specific VLAN, It enables IGMP snooping only for the specific VLAN when IGMP snooping is globally disabled.

When the fast leave feature is enabled, port information is removed from a multicast group entry immediately after fast leave message is received.

The no form of the command disables fast leave processing for a specific VLAN.

NOTE: Fast leave configurations done in a VLAN when IGMP snooping is disabled in a VLAN, will be applied only when IGMP snooping is enabled in the VLAN.

Syntax

```
ip igmp snooping fast-leave

no ip igmp snooping fast-leave
```

Mode

Config-VLAN Mode

ip igmp snooping querier

Command Objective

This commands configures the IGMP snooping Switch as a querier for a specific VLAN. When configured as a querier, the Switch sends IGMP query messages. The query messages will be suppressed if there are any routers in the network.

The no form of the command configures the IGMP snooping Switch as non-querier for a specific VLAN.

Syntax

```
ip igmp snooping querier

no ip igmp snooping querier
```

Mode

Config-VLAN Mode

ip igmp snooping query-interval

Command Objective

This command sets the time interval at which the IGMP snooping queries are sent by the Switch when configured as querier on a VLAN. The value range is between 60 to 600 seconds.

The no form of the command sets the IGMP querier interval to default value.

NOTE: The Switch must be configured as a querier for this configuration to be imposed.

Syntax

```
ip igmp snooping query-interval <(60 - 600) seconds>

no ip igmp snooping query-interval
```

Mode

Config-VLAN Mode

ip igmp snooping startup-query-interval

Command Objective This command sets the time interval between the IGMP snooping query messages sent by the Switch, during startup of the querier election process. This time interval ranges between 15 and 150 seconds and should be less than or equal to query interval divided by four.

The no form of the command sets the IGMP startup query interval to the default value.

ⓘ | **NOTE:**

The Switch should be configured as querier for the startup query interval command to produce results.

The startup query interval should be less than or equal to ¼ of the query interval.

Syntax

```
ip igmp snooping startup-query-interval <(15 - 150) seconds>

no ip igmp snooping startup-query-interval
```

Mode Config-VLAN Mode

ip igmp snooping startup-query-count

Command Objective This command sets the maximum number of general query messages sent out on Switch startup when the Switch is configured as a querier. This value ranges between two and five. Startup query messages are sent to announce the presence of the Switch along with its identity. The startup query count is manually configured to change the existing count. This value ranges between 2 and 5.The no form of the command sets the number of general query messages sent out on Switch startup when the Switch is configured as a querier to default value.

ⓘ | **NOTE:** The Switch should be configured as a querier for startup query count configuration to be effective.

Syntax

```
ip igmp snooping startup-query-count <2 - 5>

no ip igmp snooping startup-query-count
```

Mode Config-VLAN Mode

ip igmp snooping max-response-code

Command Objective This command sets the maximum response code inserted in general queries sent to host. The unit of the reponse code is tenth of second. This value ranges between 0 and 255.

The no form of the command sets the query response code to default value.

Syntax

```
ip igmp snooping max-response-code <(0 - 255)>

no ip igmp snooping max-response-code
```

Mode Config-VLAN Mode

ip igmp snooping blocked-router

Command Objective

This command configures a static router-port as blocked router port.

The no form of the command resets the blocked router ports to normal router port.

NOTE: The ports to be configured as blocked router ports, must not be configured as static router ports.

Syntax

```
ip igmp snooping blocked-router <interface-type> <0/a-b, 0/c, ...>

no ip igmp snooping blocked-router <interface-type> <0/a-b, 0/c, ...>
```

Parameter Description

- `<interface-type>` - Clears all port-level spanning-tree statistics information for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
- `<0/a-b, 0/c, ...>` - Sets the list of multicast router ports for the list of interfaces or a specific interface identifier. This value is a combination of slot number and port number separated by a slash. Port-channel ID is provided, for interface type port-channel. Use comma as a separator without space while configuring list of interfaces. Example: 0/1, 0/3 or 1, 3.

Mode

Config-VLAN Mode

show ip igmp snooping mrouter

Command Objective

This command displays the router ports for all VLANs or a specific VLAN for a given Switch or for all the Switches (if no Switch is specified). The interface details and the corresponding port number along with its type (static/dynamic are displayed.

Syntax

```
show ip igmp snooping mrouter [Vlan <vlan-id >] [detail] [switch <switch_name>]
```

Parameter Description

- `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- `detail` - Displays detailed information about the router ports
- `switch <switch_name>` - Displays the router ports for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show ip igmp snooping blocked-router

Command Objective This command displays the blocked router ports for all VLANs or a specific VLAN for a given Switch or for all the Switches (if no Switch is specified).

Syntax `show ip igmp snooping blocked-router [Vlan <vlan-id >] [switch <switch_name>]`

Parameter Description

- `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- `switch <switch_name>` - Displays the blocked router ports for specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show ip igmp snooping globals

Command Objective This command displays IGMP snooping information for all VLANs or a specific VLAN for a given Switch or for all Switches (if Switch is not specified).

Syntax `show ip igmp snooping globals [switch <switch_name>]`

Parameter Description

- `switch <switch_name>` - Displays the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show ip igmp snooping

Command Objective This command displays IGMP snooping information for all VLANs or a specific VLAN for a given context or for all the context (if no Switch is specified).

Syntax `show ip igmp snooping [Vlan <vlan-id >] [switch <switch_name>]`

Parameter Description

- `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- `switch <switch_name>` - Displays the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show ip igmp snooping groups

Command Objective This command displays IGMP group information for all VLANs or a specific VLAN or specific VLAN and group address for a given Switch or for all Switches (if no Switch is specified).

Syntax `show ip igmp snooping groups [Vlan <vlan-id > [Group <Address>]]`

Parameter Description

- `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094
- `Group <Address>` - Displays the Group Address of the VLAN ID

Mode Privileged EXEC Mode

show ip igmp snooping forwarding-database

Command Objective	show ip igmp snooping forwarding-database
Syntax	`show ip igmp snooping forwarding-database [Vlan <vlan-id>]`
Parameter Description	• `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094 • `Group <Address>` - Displays the Group Address of the VLAN ID
Mode	Privileged EXEC Mode

show ip igmp snooping statistics

Command Objective	This command displays IGMP snooping statistics for all VLANs or a specific VLAN for a given Switch or for all Switches (if no Switch is specified).
Syntax	`show ip igmp snooping statistics [Vlan <vlan-id >] [switch <switch_name>]`
Parameter Description	• `< vlan-id (1-4094)>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094 • `switch <switch_name>` - Displays the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.
Mode	Privileged EXEC Mode

show ip igmp snooping multicast-vlan

Command Objective	This command displays multicast VLAN statistics in a Switch and displays various profiles mapped to the multicast VLANs.
Syntax	`show ip igmp snooping multicast-vlan [switch <switch_name>]`
Parameter Description	• `switch <switch_name>` - Displays the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.
Mode	Privileged EXEC Mode

7

IP Commands

ip route

Command Objective This command adds a static route. The Route defines the IP address or interface through which the destination can be reached.

Syntax

```
ip route <ip_addr> <ip_mask> <ucast_addr> [<short (1-254)>]
```

```
no ip route <ip_addr> <ip_mask> <ucast_addr>
```

Parameter Description

- `<ip-address>` - Configures the IP Address of ARP Entry.
- `<mask>` - Configures the subnet mask for the IP address. This is a 32-bit number which is used to divide the IP address into network address and host address.
- `ucast_addr` - Defines the IP address or IP alias of the next hop that can be used to reach that network.

Mode Global Configuration Mode

show ip route

Command Objective This command displays the IP routing table.

Syntax

```
show ip route [ { <ip_addr> [<ip_mask>] | connected | static | summary | details} ]
```

Parameter Description

- `<ip-address>` - Displays the IP routing table for the specified destination IP Address.
- `<mask>` - Displays the IP routing table for the specified prefix mask address.
- `connected` - Displays the Directly Connected Network Routes.
- `static` - Displays the Static Routes in the table.
- `summary` - Displays the Summary of all routes.
- `details` - Displays the details of all routes.

Mode Privileged EXEC Mode

arp

Command Objective This command add a static entry in the ARP cache.

Syntax

```
arp <ucast_addr> <ucast_mac> { Vlan <vlan_id> }

no arp {<ucast_addr>}
```

Parameter Description

- `<ip-address>` - Configures the IP Address of ARP Entry.
- `<macaddr>` - The MAC address corresponding to the IP address above.
- `<vlan –id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.

Mode Global Configuration Mode

arp timeout

Command Objective This command sets the ARP (Address Resolution Protocol) cache timeout. The arp timeout defines the time period an arp entry remains in the cache. When a new timeout value is assigned, it only affects the new arp entries. All the older entries retain their old timeout values. The timeout values can be assigned to dynamic arp entries only. All static arp entries remain unaltered by the timeout value. This value ranges between 30 and 86400 seconds.

Syntax

```
arp timeout <integer (30-86400)>

no arp timeout
```

Mode Global Configuration Mode

show ip arp

Command Objective This command displays IP ARP table.

Syntax

```
show ip arp [ { Vlan <vlan_id> | <iftype> <ifnum> | <ipiftype>

<ifnum> | <ucast_addr> | <ucast_mac> | summary | information |
statistics } ]
```

Parameter Description

- `Vlan <vlan-id>` - VLAN ID is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.
- `<interface-type>` - Displays specified type of interface.
- `<ipiftype>` - Displays the IP ARP information for the specified L3 Psuedo wire interface in the system.
- `<ip-address>` - Displays the IP Address of ARP Entry.
- `<mac-address>` - Displays the MAC Address of ARP Entry.
- `summary` - Displays IP ARP Table summary.
- `information` - Displays the ARP Configuration information regarding maximum retries and ARP cache timeout.

Mode Privileged EXEC Mode

8

Link Aggregation Commands

lacp system-priority

Command Objective

This command configures the LACP priority associated with actor's system ID. This priority value ranges between 0 and 65535. The Switch with the lowest LACP decides the standby and active links in the LA.

The no form of the command resets the LACP priority to its default value.

Syntax

```
lacp system-priority <0-65535>

no lacp system-priority
```

Mode

Global Configuration Mode

port-channel load-balance

Command Objective

This command configures the load balancing policy for all port channels created in the Switch.

The policy sets the rule for distributing the Ethernet traffic among the aggregated links to establish load balancing.

The no form of the command resets the load balancing policy to its default value.

Syntax

```
port-channel load-balance ([src-mac][dest-mac][src-dest-mac][src-ip][dest-ip][src-dest-ip][dest-l4-port][src-l4-port])

no port-channel load-balance
```

Parameter Description

- `src-mac` - Distributes the load based on the source MAC address. The bits of the source MAC address in the packet are used to select the port in which the traffic should flow. Packets from different hosts use different ports in the channel, but packets from the same host use the same port.
- `dest-mac` - Distributes the load based on the destination host MAC address. The bits of the destination MAC address in the packet are used to select the port in which the traffic should flow. Packets to the same destination are sent on the same port, but packets to different destinations are sent on different ports in the channel
- `src-dest-mac` - Distributes the load based on the source and destination MAC address. The bits of the source and destination MAC address in the packet are used to select the port in which the traffic should flow.
- `src-ip` - Distributes the load based on the source IP address. The bits of the source IP address in the packet are used to select the port in which the traffic should flow.
- `dest-ip` - Distributes the load based on the destination IP address. The bits of the destination IP address in the packet are used to select the port in which the traffic should flow.
- `src-dest-ip` - Distributes the load based on the source and destination IP address. The bits of the source and destination IP address in the packet are used to select the port in which the traffic should flow.
- `dest-l4-port` - Distributes the load based on the destination Layer 4 port. The bits of the destination Layer 4 port in the packet are used to select the port in which the traffic should flow.
- `src-l4-port` - Distributes the load based on the source Layer 4 port. The bits of the source Layer 4 port in the packet are used to select the port in which the traffic should flow.

Mode

Privileged EXEC Mode

channel-group

Command Objective

This command adds the port as a member of the specified port channel that is already created in the Switch.

The no form of the command deletes the aggregation of the port from all port channels.

Syntax

```
channel-group <channel-group-number(1-8)> Mode { on | active | passive }

no channel-group
```

Parameter Description

- `<channel-group-number(1-8)>` - Adds the port as a member of the specified port channel. This is a unique value that represents the specific port-channel created. This value ranges from 1 to 8.
- `Mode` - Configures the LACP activity for the port:
  - `active` - Starts LACP negotiation un-conditionally.
  - `passive` - Starts LACP negotiation only when LACP packet is received from peer.
  - `on` - Forces the interface to channel without LACP. This is equivalent to manual aggregation.

Mode

Interface Configuration Mode (Physical Interface Mode)

lacp timeout

Command Objective

This command configures the LACP timeout period within which LACP PDUs should be received on a port to avoid timing out of the aggregated link.

The no form of the command sets the LACP timeout period to its default value.

Syntax

```
lacp timeout {long | short }

no lacp timeout
```

Parameter Description

- `long` - Configures the LACP timeout period as 90 seconds. The LACP PDU is sent every 30 seconds.
- `short` - Configures the LACP timeout period as 3 seconds. The LACP PDU is sent every second.

Mode

Interface Configuration Mode (Physical Interface Mode)

show etherchannel

Command Objective

This command displays Etherchannel information for all port-channel groups created in the Switch. This information contains admin and oper status of port-channel module, and status of protocol operate Mode for each group.

Syntax

```
show etherchannel [[channel-group-number] { detail | load-balance | port | port-channel | summary | protocol}]
```

Parameter Description

- `channel-group-number` - Displays Etherchannel information for the specified port-channel group. This is a unique value that represents the specific port-channel created. This value ranges from 1 to 8.
- `detail` - Displays detailed Etherchannel information. The information contain admin and oper status of port channel module, LACP system priority, status of protocol operate Mode for each group, port details for each group and port channel details. The port details contain port state, group to which the port belongs, port Mode, aggregation state, port-channel ID, pseudo port-channel ID, admin key, oper key, port number, port state, and LACP port-priority, wait- time, port identifier, activity and timeout. The port channel details contain port channel ID, number of member ports, ID of hot standby port, port state, status of protocol operate Mode, aggregator MAC and default port ID.
- `load-balance` - Displays the load balancing policy applied for each port-channel groups.
- `port` - Displays the status of protocol operate Mode and port details for each group. The port details contain port state, group to which the port belongs, port Mode, aggregation state, port-channel ID, pseudo port-channel ID, admin key, oper key, port number, port state, and LACP port-priority, wait-time, port identifier, activity and timeout.
- `port-channel` - Displays the admin and oper status of port channel module, and port channel details. The port channel details contain port channel ID, number of member ports, ID of hot standby port, port state, status of protocol operate Mode, aggregator MAC and default port ID.
- `summary` - Displays the admin and oper status of port channel module, number of channel groups used, number of aggregators, group IDs, and port channel ID, status of protocol operate Mode and member ports for each group.
- `protocol` - Displays the status of protocol operate Mode for each port-channel group.

Mode

Privileged EXEC Mode

9

Loopback Detection Commands

lbd

Command Objective	This command enables/disables Loopback Detection.
Syntax	`lbd { enable | disable }`
Mode	Global Configuration Mode

show lbd state

Command Objective	This command displays the Loopback Detection information.
Syntax	`show lbd state`
Mode	Privileged EXEC Mode

show lbd state

Command Objective	This command displays the Loopback Detection information of each port.
Syntax	`show lbd port state`
Mode	Privileged EXEC Mode

Link Layer Discovery Protocol Commands

set lldp

Command Objective This command transmits or receives LLDP frames from the server to the LLDP module.

Syntax

```
set lldp {enable | disable}
```

Parameter Description

- `enable` - Transmits/receives the LLDP packets between LLDP module and the server.
- `disable` - Does not transmit/receive the LLDP packets between LLDP module and the server.

Mode Global Configuration Mode

lldp transmit-interval

Command Objective This command sets the transmission interval in which the server sends the LLDP frames to the LLDP module.The value ranges between 5 and 32768 seconds.

The no form of the command sets the transmission interval to the default value.

Syntax

```
lldp transmit-interval <seconds(5-32768)>

no lldp transmit-interval
```

Mode Global Configuration Mode

lldp holdtime-multiplier

Command Objective This command sets the holdtime-multiplier value, which is the amount of time, the server should hold the LLDP. The value ranges between 2 and 10 seconds.

The no form of the command sets the multiplier to the default value.

ⓘ | **NOTE:**

TLV (Time to Live) A value that tells the receiving agent, how long the information contained in the TLV Value field is valid.

TTL = message transmission interval * hold time multiplier.

For Example, if the value of LLDP transmission interval is 30, and the value of the LLDP hold multiplier is 4, then the value 120 is encoded in the TTL field in the LLDP header.

Syntax

```
lldp holdtime-multiplier <value(2-10)>

no lldp holdtime-multiplier
```

Mode Global Configuration Mode

lldp reinitialization-delay

Command Objective This command sets the reinitialization delay time which is the minimum time an LLDP port will wait before reinitializing LLDP transmission. The value ranges between 1 and 10 seconds.

The no form of the command sets the reinitialization delay time to the default value.

Syntax

```
lldp reinitialization-delay <seconds(1-10)>

no lldp reinitialization-delay
```

Mode Global Configuration Mode

lldp tx-delay

Command Objective This command sets the transmit delay which is the minimum amount of delay between successive LLDP frame transmissions. The value ranges between 1 and 8192 seconds.

The no form of the command sets the transmit delay to the default value.

ⓘ | **NOTE:** TxDelay should be less than or equal to (0.25 * Message Tx Interval)

Syntax

```
lldp tx-delay <seconds(1-8192)>

no lldp tx-delay
```

Mode Global Configuration Mode

show lldp

Command Objective	This command displays LLDP global configuration details to initialize on an interface.
Syntax	`show lldp`
Mode	Privileged EXEC Mode

show lldp interface

Command Objective	This command displays the information about interfaces where LLDP is enabled.
Syntax	`show lldp interface [<interface-type> <interface-id>] [mac-address <mac_addr>]`
Parameter Description	• `<interface-type>` - Displays the information about the specified type of interface. The interface can be: • `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second. • `<interface-id>` - Displays the information about the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID. • `mac-address <mac_addr>` - Displays information about neighbors for the specidfied destination MAC address of the LLDP agent.
Mode	Privileged EXEC Mode

show lldp neighbors

Command Objective This command displays information about neighbors on an interface or all interfaces.

Syntax

```
show lldp neighbors [chassis-id <string(255)> port-id
<string(255)>] [<interface-type> <interface-id> ][detail]
```

Parameter Description

- `chassis-id <string(255)>` - Configures the chassis identifier string. This value is a string value with a maximum size of 255.
- `port-id <string(255)>` - Configures the port number that represents the concerned aggregation port This value is a string value with a maximum size of 255.
- `<interface-type>` - Displays information about neighbors for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays information about neighbors for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.
- `detail` - Displays the information obtained from all the received TLVs .

Mode Privileged EXEC Mode

show lldp local

Command Objective

This command displays the current Switch information that will be used to populate outbound LLDP advertisements for a specific interface or all interfaces.

Syntax

```
show lldp local {[<interface-type> <interface-id> [macaddress <mac_addr>] ] | [mgmt-addr]}
```

Parameter Description

- `<interface-type>` - Displays the current Switch information for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the current Switch information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.
- `mac-address <mac_addr>` - Displays information about neighbors for the specidfied destination MAC address of the LLDP agent.
- `mgmt-addr` - All the management addresses configured in the system and Tx enabled ports.

Mode

Privileged EXEC Mode

11

Monitor (Mirror) Commands

monitor session - destination

Command Objective

This command configures a destination port for a mirroring session.

The no form of the command removes the destination port configuration of the mirroring session.

Syntax

```
monitor session <session-id (1-3)> destination { interface
<interface-type> <interface-id>} [allow-ingress]

no monitor session <session-id (1-3)> destination { interface
<interface-type> <interface-id>}
```

Parameter Description

- `session-id` - Specifies the index of the mirroring session. This value ranges between 1 and 3.
- `interface` - Specifies the destination port for the mirroring session.
  - `<interface-type>` - Interface type. This can be: GigabitEthernet or or Port Channel.
  - `<interface-id>` - Interface identifier. This is a combination of slot number and port number.
- `allow-ingress` - Allow Packets Ingress to Destination Port.

Mode

Global Configuration Mode

monitor session - source

Command Objective This command configures a source port / remote VLAN for a mirroring session.

The no form of the command removes the source port / remote VLAN configuration of the mirroring session.

Syntax

```
monitor session <session-id (1-3)> { source { interface
<interface-type> <interface-id> [{ rx | tx | both }] }}}

no monitor session <session-id (1-3)> { source { interface
<interface-type> <interface-id> [{rx|tx|both}]
```

Parameter Description

- `session-id` - Configures the session number that is used to identify a session.
- `interface` - Configures the source interface whose traffic to be mirrored. The details to be provided are:
  - `<interface-type>` - Sets the type of interface. The interface can be:
    - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `<interface-id>` - Sets the interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash.
- `rx` - Mirrors received traffic
- `tx` - Mirrors transmitted traffic
- `both` - Specifies the traffic direction to monitor. If the traffic direction is not specified, both transmitted and received traffic is mirrored.

Mode Global Configuration Mode

no monitor session

Command Objective This command is used to remove the mirroring configuration.

Syntax

```
no monitor session {session-id}
```

Parameter Description

- `session-range` - Specifies the list of session for which mirroring configuration should be removed
- `session-id` - Specifies the index of the mirroring session.

Mode Global Configuration Mode

show monitor

Command Objective	This command displays the mirroring information present in the system.
Syntax	`show monitor [{ session <session-id > | <session-list> | all }] [detail]`
Parameter Description	• `session-id` - Displays the mirroring information for the specified index of the mirroring session. • `range` - Displays the mirroring information for the specified list of mirroring session. • `all` - Displays the mirroring information of all the sessions. • `detail` - Displays the detailed information regarding the session.
Mode	Global Configuration Mode

12

Port-Based Network Access Control Commands

dot1x system-auth-control

Command Objective This command enables dot1x in the Switch. The dot1x is an authentication mechanism. It acts as mediator between the authentication server and the supplicant (client). If the client accesses the protected resources, it contacts the authenticator with EAPOL frames.

Syntax

```
dot1x system-auth-control
```

```
no dot1x system-auth-control
```

Mode Global Configuration Mode

shutdown dot1x

Command Objective This command shuts down dot1x feature. By shutting down the dot1x feature, the supplicant-authenticator-authentication server architecture is dissolved. The data transport and authentication are directly governed by the authentication server/server. When shutdown, all resources acquired by dot1x module are released to the system.

Syntax

```
shutdown dot1x
```

```
no shutdown dot1x
```

Mode Global Configuration Mode

dot1x clear statistics

Command Objective This command clears dot1x counters for all the ports on the Switch.

Syntax

```
dot1x clear statistics {interface <iftype> <ifnum> | all},
```

Parameter Description

- interface - Displays all static multicast MAC address entries for the specified interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.

Mode Global Configuration Mode

security-suite

Command Objective This command enables/disables DoS prevention.

Syntax

```
security-suite
```

```
no security-suite
```

Mode Global Configuration Mode

dot1x guest-vlan

Command Objective This command configures Dot1x Guest VLAN ID.

Syntax

```
dot1x guest-vlan <short (1-4094)>
```

```
no dot1x guest-vlan
```

Parameter Description

- `<vlan -id>` - This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.

Mode Global Configuration Mode

dot1x default

Command Objective This command configures dot1x with default values for this port. The previous configurations on this port are reset to the default values. These details are not displayed but are the basic settings for a port.

Syntax

```
dot1x default
```

Mode Interface Configuration Mode

dot1x max-req

Command Objective This command sets the maximum number of EAP (Extensible Authentication Protocol) retries to the client by the authenticator before restarting authentication process. The count value ranges between 1 and 10.

Syntax

```
dot1x max-req <count(1-10)>
```

```
no dot1x max-req
```

Mode Interface Configuration Mode

dot1x max-start

Command Objective This command sets the maximum number of EAPOL retries to the authenticator. The value range is 1 to 65535.

Syntax

```
dot1x max-start <count(1-65535)>
```

```
no dot1x max-start
```

Mode Interface Configuration Mode

dot1x reauthentication

Command Objective This command enables periodic re-authentication from authenticator to client. The periodic re-authentication is requested to ensure if the same supplicant is accessing the protected resources. The amount of time between periodic re-authentication attempts can be configured manually.

Syntax

```
dot1x reauthentication

no dot1x reauthentication
```

Mode Interface Configuration Mode

dot1x timeout

Command Objective This command sets the dot1x timers. The timer module manages timers, creates memory pool for timers, creates timer list, starts and stops timer. It provides handlers to respective expired timers.

Syntax

```
dot1x timeout {quiet-period <short(0-65535)> | {reauth-period |
server-timeout | supp-timeout | tx-period | start-period | held-
period | auth-period} <short(1-65535)>}

no dot1x timeout {quiet-period | reauth-period | server- timeout
| supp-timeout | tx-period | start-period | held-period

| auth-period}
```

Parameter Description

- `quiet-period <value (0-65535)>` - Configures the quiet- period. Number of seconds that the Switch remains in the quiet state following a failed authentication exchange with the client.
- `reauth-period` - Configures the reath-period. Number of seconds between re-authentication attempts.
- `server-timeout` - Configures the number of seconds that the Switch waits for the retransmission of packets to the authentication server.
- `supp-timeout` - Configures the number of seconds that the Switch waits for the retransmission of packets to the client.
- `tx-period` - Configures the number of seconds that the Switch waits for a response to an EAP-request/identity frame, from the client before retransmitting the request.
- `start-period` - Configures the number of seconds that the supplicant waits between successive retries to the authenticator.
- `held-period` - Configures the number of seconds that the supplicant waits before trying to acquire the authenticator.
- `auth-period <value(1-65535)>` - Configures the number of seconds that the supplicant waits before timing-out the authenticator

Mode Interface Configuration Mode

dot1x port-control

Command Objective This command configures the authenticator port control parameter. The dot1x exercises port based authentication to increase the security of the network. The different Modes employed to the ports offer varied access levels. The 802.1x protocol is supported on both Layer 2 static-access ports and Layer 3 routed ports.

Syntax

```
dot1x port-control {auto|force-authorized|force-unauthorized}
```

```
no dot1x port-control
```

Parameter Description

- `auto` - Configures the 802.1x authentication process in this port. Causes the port to begin the unauthorized state, allowing only EAPOL frames to be sent and received through the port. The authentication process begins when the link state of the port transitions from down to up or when an EAPOL-start frame is received. The Switch requests the identity of the client and begins relaying authentication messages between the client and the authentication server. The Switch can uniquely identify each client attempting to access the network by the client's MAC address.
- `force-authorized` - Configures the port to allow all the traffic through this port. Disables 802.1X authentication and causes the port to transit to the authorized state without requiring authentication exchange. The port transmits and receives normal traffic without 802.1X- based authentication of the client.
- `force-unauthorized` - Configures the port to block all the traffic through this port. Causes the port to remain in the unauthorized state, ignoring all attempts by the client to authenticate. The Switch cannot provide authentication services to the client through the interface.

Mode Interface Configuration Mode

dot1x guest-vlan enable

Command Objective This command enables/disables guest-vlan feature.

Syntax

```
dot1x guest-vlan enable
```

```
no dot1x guest-vlan enable
```

Mode Interface Configuration Mode

show dot1x

Command Objective This command displays dot1x information. The configured information can be viewed by running this show command. When there is any change in the configuration to ensure that the port is configured as desired, the show command is used.

Syntax

```
show dot1x [{ interface <interface-type> <interface-id> |
statistics interface <interface-type> <interface-id> |
supplicant- statistics interface <interface-type> <interface-
id>|local- database | mac-info [address <aa.aa.aa.aa.aa.aa>] |
mac- statistics [address <aa.aa.aa.aa.aa.aa>] | all }]
```

Parameter Description

- `interface <interface-type> <interface-id>` - Displays dot1x parameters for the Switch or the specified interface.
- `statistics interface <interface-type> <interface-id>` - Displays dot1x authenticator port statistics parameters for the Switch or the specified interface.
- `supplicant-statistics interface<interface-type> <interface-id>` - Displays dot1x supplicant statistics parameters for the Switch or the specified interface.
- `local-database` - Displays dot1x authentication server database with user name and password.
- `mac-info [address <aa.aa.aa.aa.aa.aa>]` - Displays dot1x information for all MAC session or the specified MAC address.
- `mac-statistics [address <aa.aa.aa.aa.aa.aa>]` - Displays dot1x MAC statistic for all MAC session or the specified MAC address.
- `all` - Displays dot1x status for all interfaces.

Mode Privileged EXEC Mode

show dot1x guest-vlan

Command Objective Displays dot1x Guest Vlan information.

Syntax

```
show dot1x guest-vlan
```

Mode Privileged EXEC Mode

show security-suite

Command Objective Displays Dos information.

Syntax

```
show security-suite
```

Mode Privileged EXEC Mode

dot1x re-authenticate

Command Objective	This command initiates re-authentication of all dot1x-enabled ports or the specified dot1x-enabled port. This initializes the state machines and sets up the environment for fresh authentication. Re-authentication is manually configured if periodic re- authentication is not enabled. Re-authentication is requested by the authentication server to the supplicant to furnish the identity without waiting for the configured number of seconds (re-authperiod). If no interface is specified, re-authentication is initiated on all dot1x ports.
Syntax	`dot1x re-authenticate [interface <interface-type><interface-id>]`
Parameter Description	• `<interface type>` - Configures the specified type of interface. • `<interface id>` - Configures the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.
Mode	Privileged EXEC Mode

exit

Command Objective	This command exits the current mode and reverts to the mode used prior to the current mode.
Syntax	`exit`
Description	This command exits the current mode and reverts to the mode used prior to the current mode.
Mode	All

13

Power Over Ethernet Commands

Power Inline

Command Objective This command enables/disables Power Over Ethernet on the specified port to provide power over a copper Ethernet cable to an endpoint or powered device.

Syntax

```
power inline { enable | disable }
```

Mode Interface Configuration Mode

Power Inline Limit

Command Objective This command limits Power Over Ethernet on the specified port to provide power over a copper Ethernet cable to an endpoint or powered device.

Syntax

```
power inline limit { auto | <short(1-30)> }
```

Parameter Description

- `auto` - automatically and allocates power to the PoE port after device detection, if enough power is available.
- `<short(1-30)>` - The maximum wattage feature limits the power allocated on the port. This value ranges between 1 and 30 watts.

Mode Interface Configuration Mode

Power Inline Priority

Command Objective This command sets the priority of the Power Over Ethernet on the specified port.

Syntax

```
power inline priority { critical | high | low }
```

Parameter Description

- `critical` - Sets the Power Over Ethernet port priority to critical
- `high` - Sets the Power Over Ethernet port priority to high
- `low` - Sets the Power Over Ethernet port priority to low

Mode Interface Configuration Mode

Show Power Detail

Command Objective This command displays the Power Over Ethernet power supply status information such as PoE Global admin state, PSE operational status and Maximum power supply.

Syntax

```
show power detail
```

Mode Privileged EXEC Mode

Show Power Inline

Command Objective This command displays the Power Over Ethernet power supply status information of each Power Sourcing Equipment.

Syntax `show power inline [{<interface-type> <interface-id>}]`

Parameter Description

- `<interface-type>` - Displays the information about the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
- `<interface-id>` - Displays the information about the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1.

Mode Privileged EXEC Mode

14

Quality of Service Commands

storm-control

Command Objective

This command sets the storm control rate for broadcast, unknown-multicast and DLF packets.

The no form of the command sets storm control rate for broadcast, unknown-multicast and DLF packets to the default value.

Syntax

```
storm-control { broadcast | unknown-multicast | dlf } level
<rate-value>

no storm-control { broadcast | unknown-multicast | dlf } level
```

Parameter Description

- `broadcast` - Broadcast packets.
- `unknown-multicast` - Unknown multicast packets.
- `dlf` - Unknown unicast packets.
- `level` - Storm-control suppression level as a total number of packets per second.

Mode

Interface Configuration Mode

Rate-limit

Command Objective

This command enables the rate limiting on an interface. The no form of the command disables the rate limiting.

Syntax

```
rate-limit { output | input } [<integer(1-80000000)>] no rate-
limit { output | input }
```

Parameter Description

- `output` - egress limitation.
- `input` - ingress limitation.
- `<integer(16-10000000)>` - Line rate in kbps.

Mode

Interface Configuration Mode

qos

Command Objective This command enables or disables the QoS subsystem.

Syntax
```
qos {enable | disable}
```

Parameter Description
- `enable` - Enables QoS subsystem
- `disable` - Disables Qos subsystem

Mode Global Configuration Mode

qos trust

Command Objective This command sets qos trust mode.

Syntax
```
qos trust {cos | dscp | cos-dscp}
```

Parameter Description
- `cos` - trust cos.
- `dscp` - trust dscp.
- `cos-dscp` - trust cos, if cos not set, trust dscp.

Mode Global Configuration Mode

priority-map

Command Objective This command sets the type of the incoming priority mapping to queue.

The no form of the command sets default value.

Syntax
```
priority-map in-priority-type { vlanPri | ipDscp } <integer(0-63)> [<integer(0-63)>] [<integer(0-63)>] [<integer(0-63)>] [<integer(0-63)>] [<integer(0-63)>] [<integer(0-63)>] to <integer(1-8)>
```

Parameter Description
- `vlanPri` - Vlan priority.
- `ipDscp` - DSCP.
- `<integer(0-63)>` - Priority value. (0-7) for vlanPri, (0-63) for ipDscp.
- `integer(1-8)` - Queue id.

Mode Global Configuration Mode

scheduler

Command Objective This command creates a Scheduler and configures the Scheduler parameters.

Syntax
```
scheduler sched-algo {strict-priority | {wrr [weight <integer(0-128)> <integer(0-128)> <integer(0-128)> <integer(0-128)>

<integer(0-128)> <integer(0-128)> <integer(0-128)> <integer(0-128)>]}}
```

Parameter Description
- `strict-priority` - strict Priority.
- `wrr` - weighted Round Robin.
- `weight <integer(0-128)> <integer(0-128)> <integer(0-128)><integer(0-128)> <integer(0-128)> <integer(0-128)><integer(0-128)> <integer(0-128)> – weight of wrr from queue 1 to queue 8.`

Mode Global Configuration Mode

class-policy

Command Objective This command creates a qos policy.

The no form of the command deletes a qos policy.

Syntax

```
class-policy <string(23)>
```

```
no class-policy <string(23)>
```

Parameter Description

- `<string(23)>` - Name of qos policy.

Mode Global Configuration Mode

qos interface

Command Objective This command sets the default ingress user priority for the port.

Syntax

```
qos interface <iftype> <ifnum> def-user-priority <integer(0-7)>
```

Parameter Description

- `iftype` - Interface type.
- `ifnum` - Interface number.
- `def-user-priority` - Default ingress user priority for the port.

Mode Global Configuration Mode

match policy – tcp/udp

Command Objective

This command specifies the TCP/UDP packets to be forwarded based on the associated parameters.

Syntax

```
match policy { any | host <mac_addr> } { any | host
<mac_addr> } [ ethertype <integer (1-65535)> ] [ vlan <short (1-
4094)>] [ vlan-priority <short (0-7)>] { tcp | udp } {any | host
<ip_addr>| <ip_addr> <ip_mask> } [eq <short (1-65535)>] { any |
host <ip_addr> | <ip_addr> <ip_mask> } [eq <short (1-65535)>]
[dscp <integer (0-63)>] [action { tos <short(0-7)> | dscp <short
(0-63)>}]
```

Parameter Description

- `any | host <mac_addr>` - Source MAC address to be matched with the packet
- `any | host <mac_addr>` - Destination MAC address to be matched with the packet
- `ethertype <integer (1-65535)>` - Specifies the non-IP protocol type to be filtered.
- `vlan <short (1-4094)>` - VLAN value to match against incoming packets.
- `vlan-priority <short (0-7)>` - VLAN priority value to match against incoming packets.
- `tcp` - Transport Control Protocol.
- `udp` - User Datagram Protocol.
  - any | host <ip_addr>| <ip_addr> <ip_mask> - Source IP address can be
  - 'any' or
  - the dotted decimal address or
- the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip_addr> | <ip_addr> <ip_mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.
- `tos <short(0-7)>` - set tos to value.
- `dscp <short (0-63)>` - set dscp to value.

Mode

Policy Map Configuration Mode

match policy – icmp

Command Objective

This command specifies the ICMP packets to be forwarded based on the associated parameters.

Syntax

```
match policy { any | host <mac_addr> } { any | host
<mac_addr> } [ ethertype <integer (1-65535)> ] [ vlan <short (1-
4094)>] [ vlan-priority <short (0-7)>] icmp {any | host
<ip_addr>| <ip_addr> <ip_mask> } { any | host <ip_addr> |
<ip_addr> <ip_mask> } [type <short(0-255)>] [code <short(0-
255)>] [dscp <integer (0-63)>] [action { vpt <short(0-7)> | dscp
<short (0-63)>}]
```

Parameter Description

- `any | host <mac_addr>` - Source MAC address to be matched with the packet
- `any | host <mac_addr>` - Destination MAC address to be matched with the packet
- `ethertype <integer (1-65535)>` - Specifies the non-IP protocol type to be filtered.
- `vlan <short (1-4094)>` - VLAN value to match against incoming packets.
- `vlan-priority <short (0-7)>` - VLAN priority value to match against incoming packets.
- `any | host <ip_addr>| <ip_addr> <ip_mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `eq <short (1-65535)>` - Port Number.
- `any | host <ip_addr> | <ip_addr> <ip_mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address.
- `type <short (0-255)>` - message type
- `code <short (0-255)>` - message code
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.
- `tos <short(0-7)>` - set tos to value.
- `dscp <short (0-63)>` - set dscp to value.

Mode

Policy Map Configuration Mode

match policy - ip/ospf/pim/protocol type

Command Objective This command specifies the ip/ospf/pim/protocol type packets to be forwarded based on the associated parameters.

Syntax

```
match policy { any | host <mac_addr> } { any | host
<mac_addr> } [ ethertype <integer (1-65535)> ] [ vlan <short (1-
4094)>] [ vlan-priority <short (0-7)>] { ip | ospf | pim |
<short (1-255)>} {any | host <ip_addr>| <ip_addr> <ip_mask> } {
any | host <ip_addr> | <ip_addr> <ip_mask> } [dscp <integer (0-
63)>] [action { vpt <short(0-7)> | dscp <short (0-63)>}]
```

Parameter Description

- `any | host <mac_addr>` - Source MAC address to be matched with the packet
- `any | host <mac_addr>` - Destination MAC address to be matched with the packet
- `ethertype <integer (1-65535)>` - Specifies the non-IP protocol type to be filtered.
- `vlan <short (1-4094)>` - VLAN value to match against incoming packets.
- `vlan-priority <short (0-7)>` - VLAN priority value to match against incoming packets.
- `any | host <ip_addr>| <ip_addr> <ip_mask>` - Source IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is from and the network mask to use with the source address.
- `any | host <ip_addr> | <ip_addr> <ip_mask>` - Destination IP address can be
  - 'any' or
  - the dotted decimal address or
  - the IP Address of the network or the host that the packet is destined for and the network mask to use with the destination address.
- `dscp <short (0-63)>` - Differentiated services code point provides the quality of service control.
- `tos <short(0-7)>` - set tos to value.
- `dscp <short (0-63)>` - set dscp to value.

Mode Policy Map Configuration Mode

no class-policy

Command Objective This command deletes the class-policy.

Syntax

```
No class-policy <string(31)>
```

Parameter Description

- `<string(31)>` - Name of qos policy.

Mode Global Configuration Mode

show qos global info

Command Objective This command displays QoS related global configurations.

Syntax `show qos global info`

Mode Privileged EXEC Mode

show priority-map

Command Objective This command displays the priority mapping to queue.

Syntax `show priority-map in-priority-type { vlanPri | ipDscp }`

Parameter Description

- `vlanPri`- Vlan priority.
- `ipDSCP` - IP DSCP.

Mode Privileged EXEC Mode

show class-policy

Command Objective This command displays the qos policy.

Syntax `show class-policy [{<string(23)> | interface [<iftype> <ifnum>]}]`

Parameter Description

- `<string(31)>` - Name of qos policy.
- `iftype` - Interface type.
- `ifnum` - Interface number.

Mode Privileged EXEC Mode

show scheduler

Command Objective This command displays the configured Scheduler.

Syntax `show scheduler`

Mode Privileged EXEC Mode

show qos def-user-priority

Command Objective This command displays the configured default ingress user priority for a port.

Syntax `show qos def-user-priority [interface <iftype> <ifnum>]`

Parameter Description

- `iftype` - Interface type.
- `ifnum` - Interface number.

Mode Privileged EXEC Mode

qos trust

Command Objective This command enable/disable qos trust on port.

Syntax `qos trust {enable | disable}`

Parameter Description

- `enable` - enable qos trust on port.
- `disable` - disable qos trust on port.

Mode Interface Configuration Mode

service-policy

Command Objective	This command enables qos policy on the interface. The no form of this command removes qos policy from the interface.
Syntax	`service-policy <string(31)> in` `no service-policy <string(31)>`
Parameter Description	• `<string(31)>` - Name of qos policy.
Mode	Interface Configuration Mode

15

RADIUS Commands

radius-server host

Command Objective

This command configures the RADIUS client with the parameters (host, timeout, key, retransmit).

Syntax

```
radius-server host {ipv4-address | host-name} [auth-port <integer(1-65535)>] [acct-port <integer(1-65535)>]

[timeout <1-30>] [retransmit <1-10>] [key <secret-key- string>] [primary]

no radius-server host {ipv4-address | host-name} [primary]
```

Parameter Description

- `ipv4-address` - Configures the IPv4 address of the RADIUS server host.
- `auth-port <integer(1-65535)>` - Configures a specific UDP (User Datagram Protocol) destination port on this RADIUS server to be used solely for the authentication requests. The value of the auth port ranges between 1 and 65535.
- `acct-port <integer(1-65535)>` - Configures a specific UDP destination port on this RADIUS to be solely used for accounting requests. The value of the auth port ranges between 1 and 65535.
- `timeout <1-30>` - Configures the time period in seconds for which a client waits for a response from the server before re-ransmitting the request. The value of the time out in ranges between 1 to 10 in seconds.
- `retransmit <1-10>` - Configures the maximum number of attempts the client undertakes to contact the server. The value number of retransmit attempts ranges between 1 and 10.
- `key <secret-key-string>` - Configures the Per-server encryption key which specifies the authentication and encryption key for all RADIUS communications between the authenticator and the RADIUS server. The value of the maximum length of the secret key string is 46.
- `primary` - Sets the RADIUS server as the primary server. Only one server can be configured as the primary server. Any existing primary server will be replaced when the command is executed with this option.

Mode

Global Configuration Mode

show radius server

Command Objective	This command displays RADIUS server Host information which contains, Index, Server address, Shared secret, Radius Server status, Response Time, Maximum Retransmission, Authentication Port and Accounting Port.
Syntax	`show radius server [{<ucast_addr> | <string>}]`
Parameter Description	• `<ucast_addr>` - Displays the related information of the specified unicast address of the RADIUS server host.
Mode	Privileged EXEC Mode

show radius statistics

Command Objective	This command displays RADIUS Server Statistics for the data transfer between server and the client from the time of initiation.
Syntax	`show radius statistics`
Mode	Privileged EXEC Mode

16

Remote Network Monitoring (RMON) Commands

set rmon

Command Objective	This command is used to enable or disable the RMON feature.
Syntax	`set rmon {enable | disable}`
Parameter Description	• `enable` - Enables the RMON feature in the system. On enabling, the RMON starts monitoring the networks both local and remote and provides network fault diagnosis • `disable` - Disables the RMON feature in the system. On disabling, the RMON's network monitoring is called off.
Mode	Global Configuration Mode

rmon alarm

Command Objective

This command sets an alarm on a MIB object. The Alarm group periodically takes statistical samples from variables in the probe and compares them to thresholds that have been configured.

Syntax

```
rmon alarm <short (1-65535)> stats <short (1-65535)>

{etherStatsDropEvents | etherStatsOctets | etherStatsPkts
|etherStatsBroadcastPkts | etherStatsMulticastPkts |
etherStatsCRCAlignErrors | etherStatsUndersizePkts |
etherStatsOversizePkts |etherStatsFragments |etherStatsJabbers
|etherStatsCollisions |etherStatsPkts64Octets
|etherStatsPkts65to127Octets |etherStatsPkts128to255Octets
|etherStatsPkts256to511Octets |etherStatsPkts512to1023Octets|
etherStatsPkts1024to1518Octets

} <short (1-65535)> { absolute

| delta } rising-threshold

<integer (0-2147483647)>

[<integer (1- 65535)>]

falling-threshold <integer

(0-2147483647)> [<integer (1-65535)>] [owner <string (127)>] no
rmon alarm <number(1-65535)>
```

Parameter Description

- `<alarm-number>/ <number (1-65535)>` - Displays the value of the statistic during the last sampling period. This value remains available until the current sampling period is completed. For example, if the sample type is deltaValue, this value will be the difference between the samples at the beginning and end of the period. If the sample type is absoluteValue, this value will be the sampled value at the end of the period. This value is compared with the rising and falling thresholds. The value ranges between 1 and 65535.
- `<mib-object-id (255)>` - Identifies the mib object.
- `<sample-interval-time (1-65535)>` - Identifies an entry in the alarm table. Each such entry defines a diagnostic sample at a particular level for a MIB object in the device. This value ranges between 1 and 65535 seconds.
- `absolute` - Compares the value of the selected variable with the thresholds at the end of the sampling interval.
- `delta`- Subtracts the value of the selected variable at the last sample from the current value, and the difference is compared with the thresholds at the end of the sampling interval.
- `rising-threshold <value (0-2147483647)>` - Configures the rising threshold value. If the startup alarm is set as Rising alarm or RisingOrFalling alarm and if the configured threshold value is reached, then an alarm is raised. When the current sampled value is greater than or equal to the configured Rising threshold, and the value at the last sampling interval is less than this configured threshold, a single event will be generated. The value ranges between 0 and 2147483647.
- `falling-threshold <value (0-2147483647)>` - Configures the falling threshold value. If the startup alarm is set as Falling alarm or RisingOrFalling alarm and if the configured threshold value is reached, then an alarm is raised. When the current sampled value is lesser than or equal to the configured Falling threshold, and the value at the last sampling interval is greater than this threshold, a single event will be generated. This value ranges between 0 and 2147483647.
- `<falling-event-number (1-65535)>` - Raises the index of the event when the Falling threshold is reached. The event entry identified by a particular value of this index is the same as identified by the same value of the event index object. This value ranges between 1 and 65535.
- `owner<ownername (127)>` - Sets the entity that are configured this entry.

Mode

Global Configuration Mode

rmon event

Command Objective This command adds an event to the RMON event table. The added event is associated with an RMON event number.

Syntax

```
rmon event <number (1-65535)> [description <event-description (127)>] [log] [owner <ownername (127)>] [trap <community (127)>]

no rmon event <number (1-65535)>
```

Parameter Description

- `<number (1-65535)>` - Sets the number of events to be added in the event table. This value ranges between 1 and 65535.
- `description<event-description (127)>` - Provides a description for the event. This value is a string with a maximum length of 127.
- `log`- Creates an entry in the log table for each event.
- `owner<ownername (127)>` - Displays the entity that are configured this entry. This value is a string with a maximum value of 127.
- `trap<community (127)>` - Generates a trap, The SNMP community string is to be passed for the specified trap. This value is a string with a maximum value of 127.

Mode Global Configuration Mode

rmon collection stats

Command Objective This command enables RMON statistic collection on the interface/ VLAN.

The no form of the command disables RMON statistic collection on the interface/ VLAN.

Syntax

```
rmon collection stats <index (1-65535)> [owner <ownername (127)>]

no rmon collection stats <index (1-65535)>
```

Parameter Description

- `<index (1-65535)>` - Identifies an entryin the statistics table.. This value ranges between 1 and 65535.
- `owner <ownername (127)>` - Configures the the name of the owner of the RMON group of statistics.

Mode Interface Configuration Mode / Config VLAN Mode

mon collection history

Command Objective

This command enables history collection of interface/ VLAN statistics in the buckets for the specified time interval.

The no form of the command disables the history collection on the interface/VLAN.

Syntax

```
rmon collection history <index (1-65535)> [buckets <bucket-number (1-65535)>] [interval <seconds (1-3600)>] [owner <ownername (127)>]

no rmon collection history <index (1-65535)>
```

Parameter Description

- `<index (1-65535)>` - Identifies an entry in the history control table. Each such entry defines a set of samples at a particular interval for an interface on the device. This value ranges between 1 and 65535.
- `buckets<bucket-number (1-65535)>` - Configures the number of buckets desired for the RMON collection history group of statistics. This is the requested number of discrete time intervals over which data is to be saved in the part of the media-specific table associated with this History Control EntryThe polling cycle is the bucket interval where the interface statistics details are stored. This value ranges between 1 and 65535.
- `interval<seconds (1-3600)>` - Configures the time interval over which the data is sampled for each bucket. The value ranges between 1 and 3600.
- `owner<ownername (127)>` - Configures the name of the owner of the RMON group of statistics.

Mode

Interface Configuration Mode / Config VLAN Mode

show rmon

Command Objective

This command displays the RMON statistics, alarms, events, and history configured on the interface.

Syntax

```
show rmon [statistics [<stats-index (1-65535)>]] [alarms] [events] [history [history-index (1-65535)] [overview]]
```

Parameter Description

- `statistics` - Displays a collection of statistics for a particular Ethernet Interface. The probe for each monitored interface on this device measures the statistics.
- `alarms` - Displays the value of the statistic during the last sampling period. This value remains available until the current sampling period is completed.
- `events` - Generates events whenever an associated condition takes place in the device. The Conditions may be alarms. Alarms are generated when a sampled statistical variable value exceeds the defined threshold value. Alarm module calls events module.
- `history` - Displays the history of the configured RMON.
- `overview` - Displays only the overview of rmon history entries.

Mode

Privileged EXEC Mode

17

Simple Network Management Protocol (SNMP) Commands

enable snmpagent

Command Objective	This command enables SNMP agent which provides an interface between a SNMP manager and the Switch. The agent processes SNMP packets received from the manager, frames the appropriate response packets and sends them to the manager.
Syntax	`enable snmpagent`
Mode	Global Configuration Mode

disable snmpagent

Command Objective	This command disables SNMP agent.
Syntax	`disable snmpagent`
Mode	Global Configuration Mode

snmp community

Command Objective This command enables SNMP agent which provides an interface between a SNMP manager and the Switch. The agent processes SNMP packets received from the manager, frames the appropriate response packets and sends them to the manager.

Syntax

```
snmp community name <CommunityName> security
<SecurityName> [transporttag <TransportTagIdentifier | none>]
[context <name>]

no snmp community name < CommunityName >
```

Parameter Description

- `name<CommunityName>` - Creates a community name which stores the community string.
- `security<SecurityName>` - Stores the security model of the corresponding Snmp community name. string specified by the corresponding instance of snmp community name
- `<TransportTagIdentifier>` - Specifies a set of transport endpoints from which a command responder application can accept management request.
- `[context <name>]` - Indicates the location of the context through which the management information is accessed when using the community string specified by the corresponding instance of snmp community name

Mode Global Configuration Mode

snmp group

Command Objective This command configures SNMP group details.

The no form of the command removes the SNMP group details.

Syntax

```
snmp group <GroupName> user <UserName> security-model {v1| v2c |
v3 }

no snmp group <GroupName> user <UserName> security-model{v1 |
v2c | v3 }
```

Parameter Description

- <GroupName> - Creates a name for an SNMP group
- user<UserName> - Sets an user for the configured group.
- security-model - Sets the security model for SNMP
  - v1 - Sets the SNMP version as Version 1.
  - v2c - Sets the SNMP version as Version 2.
  - v3 - Sets the SNMP version as Version 3.

Mode Global Configuration Mode

snmp access

Command Objective

This command configures the SNMP group access details. To configure an SNMP access along with the group, a group must have already been created using the snmp group command.

The no form of the command removes the SNMP group access details.

Syntax

```
snmp access <GroupName> {v1 | v2c | v3 {auth | noauth | priv}}
[read <ReadView | none>] [write <WriteView | none>] [notify
<NotifyView | none>]
```

```
no snmp access <GroupName> {v1 | v2c | v3 {auth | noauth |
priv}}
```

Parameter Description

- `<GroupName>` - Sets the name of the group for which access is to be provided.
- `v1 | v2c | v3` - Sets the SNMP verison.
  - `v1` - Sets the SNMP version as Version 1.
  - `v2c` - Sets the SNMP version as Version 2.
  - `v3` - Sets the SNMP version as Version 3. It is the most secure model as it allows packet encryption with the priv key word
    - `auth` - Enables Message digest (MD5) or Secure Hash Algorithm (SHA) packet authentication.
    - `noauth` - Sets no-authentication
    - `priv` - Sets both authentication and privacy
- `read` - Mentions the MIB view of the SNMP context to which read access is authorized by this entry
- `write` - Mentions the MIB view of the SNMP context to which write access is authorized by this entry
- `notify` - Mentions the MIB view of the SNMP context to which notification access is authorized by this entry

Mode

Global Configuration Mode

snmp engineid

Command Objective

This command configures the engine ID that is utilized as a unique identifier of a SNMPv3 engine. This engine ID is used to identify a source SNMPv3 entity and a destination SNMPv3 entity to coordinate the exchange of messages between the source and the destination.

The no form of the command resets the engine ID to the default value.

Syntax

```
snmp engineid <EngineIdentifier>
```

```
no snmp engineid
```

Mode

Global Configuration Mode

snmp view

Command Objective

This command configures the SNMP view.

The no form of the command removes the SNMP view.

Syntax

```
snmp view <ViewName> <OIDTree> [mask <OIDMask>] {included| excluded}

no snmp view <ViewName> <OIDTree>
```

Parameter Description

- `<ViewName>` - Specifies the view name for which the view details are to be configured. This is a string value with maximum size as 32.
- `<OIDTree>` - Specifies the sub tree value for the particular view.
- `mask <OIDMask>` - Specifies a mask value for the particular view.
- `included` - Allows access to the subtree
- `excluded` - Denies access to the subtree

Mode

Global Configuration Mode

snmp targetaddr

Command Objective

This command configures the SNMP target address.

The no form of the command removes the configured SNMP target address.

Syntax

```
snmp targetaddr <TargetAddressName> param <ParamName>

{<IPAddress> | <IP6Address>} [timeout <Seconds(1-1500)] [retries <RetryCount(1-3)] [taglist <TagIdentifier | none>] [port <integer (1-65535)>]

no snmp targetaddr <TargetAddressName>
```

Parameter Description

- `<TargetAddressName>` - Configures a unique identifier of the Target.
- `param<ParamName>` - Configures the parameters when generating messages to be sent to transport address.
- `IPAddress` - Configures a IP target address to which the generated SNMP notifications are sent.
- `IP6Address` - Configures a IP6 target address to which the generated SNMP notifications are sent.
- `timeout<Seconds(1-1500)>` - Sets the time in which the SNMP agent waits for a response from the SNMP Manager before retransmitting the Inform Request Message. The value ranges between 1 and 1500 seconds.
- `retries<RetryCount(1-3)>` - Sets the maximum number of times the agent can retransmit the Inform Request Message. This value ranges between 1 and 3.
- `taglist<TagIdentifier | none>` - Sets the tag identifier that selects the target address for the SNMP. The taglist can also be set as none using the none option.
- `port <integer (1-65535)>` - Configures a port number through which the generated SNMP notifications are sent to the target address. The value ranges between 1 and 65535.

Mode

Global Configuration Mode

snmp targetparams

Command Objective

This command configures the SNMP target parameters.

The no form of the command removes the SNMP target parameters.

Syntax

```
snmp targetparams <ParamName> user <UserName> security- model
{v1 | v2c | v3 {auth | noauth | priv}} message-processing {v1 |
v2c | v3}

no snmp targetparams <ParamName>
```

Parameter Description

- `<ParamName>` - Sets a unique identifier of the parameter.
- `User <UserName>` - Sets an user for which the target parameter is to be done.
- `security-model` - Sets the security model
  - `v1` - Sets the SNMP version as Version 1.
  - `v2c` - Sets the SNMP version as Version 2.
  - `v3` - Sets the SNMP version as Version 3. It is the most secure model as it allows packet encryption with the priv key word
    - `auth` - Enables Message digest (MD5) or Secure Hash Algorithm (SHA) packet authentication
    - `noauth` - Sets no-authentication
    - `priv` - Specifies both authentication and privacy
- `message-processing` - Sets the message processing model
  - `v1` - Sets the SNMP version as Version 1.
  - `v2c` - Sets the SNMP version as Version 2.
  - `v3` - Sets the SNMP version as Version 3. It is the most secure model as it allows packet encryption with the priv key word

Mode

Global Configuration Mode

snmp user

Command Objective

This command configures the SNMP user details.

The no form of the command removes the SNMP user details.

Syntax

```
snmp user <UserName> [auth {md5 | sha} <passwd> [priv {{{DES|
AES_CFB128} <passwd> } | None}]]

no snmp user <UserName>
```

Parameter Description

- `<UserName>` - Configures an user name which is the User- based Security Model dependent security ID.
- `auth` - Sets an authentication Algorithm . Options are:
  - `md5` - Sets the Message Digest 5 based authentication.
  - `sha` - Sets the Security Hash Algorithm based authentication.
- `<Passwd>` - Sets the authentication password that will be used for the configured authentication algorithm.
- `priv` - Sets the DES encryption and also the password to be used for the encryption key. Options are:
  - `DES` - Configures the data encryption standard algorithm related configuration.
  - `AES_CFB128` - Configures Advanced Encryption Standard (AES) algorithm for encryption.
  - `<Passwd>` - Sets the authentication password that will be used for the configured authentication algorithm.
  - `None` - Sets no encryption configurations.

Mode

Global Configuration Mode

snmp notify

Command Objective

This command configures the SNMP notification details.

The no form of this command removes the SNMP notification details.

Syntax

```
snmp notify <NotifyName> tag <TagName> type {Trap | Inform}

no snmp notify <NotifyName>
```

Parameter Description

- `<NotifyName>` - Configures an unique identifier associated with the entry.
- `tag<TagName>` - Sets a notification tag, which selects the entries in the Target Address Table.
- `type` - Sets the notification type. The list contains:
  - `Trap` - Allows routers to send traps to SNMP managers. Trap is a one-way message from a network element such as a router, switch or server; to the network management system.
  - `Inform` - Allows routers / switches to send inform requests to SNMP managers

Mode

Global Configuration Mode

system name

Command Objective	This command sets the system name.
Syntax	`system name <system name>`
Mode	Global Configuration Mode

system location

Command Objective	This command sets the location name.
Syntax	`system location <location name>`
Mode	Global Configuration Mode

system contact

Command Objective	This command sets the contact information.
Syntax	`system contact <contact info>`
Mode	Global Configuration Mode

show snmp

Command Objective	This command displays the status information of SNMP communications.
Syntax	`show snmp`
Mode	Privileged EXEC Mode

show snmp community

Command Objective	This command displays the configured SNMP community details.
Syntax	`show snmp community`
Mode	Privileged EXEC Mode

show snmp group

Command Objective	This command displays the configured SNMP groups.
Syntax	`show snmp group`
Mode	Privileged EXEC Mode

show snmp group access

Command Objective	This command displays the configured SNMP group access details.
Syntax	`show snmp group access`
Mode	Privileged EXEC Mode

show snmp engineid

Command Objective	This command displays the Engine Identifier.
Syntax	`show snmp engineID`
Mode	Privileged EXEC Mode

show snmp viewtree

Command Objective	This command displays the configured SNMP Tree views.
Syntax	`show snmp viewtree`
Mode	Privileged EXEC Mode

show snmp targetaddr

Command Objective	This command displays the configured SNMP target Addresses.
Syntax	`show snmp targetaddr`
Mode	Privileged EXEC Mode

show snmp targetparam

Command Objective	This command displays the configured SNMP Target Address Parameters
Syntax	`show snmp targetparm`
Mode	Privileged EXEC Mode

show snmp user

Command Objective	This command displays the configured SNMP users.
Syntax	`show snmp user`
Mode	Privileged EXEC Mode

show snmp notif

Command Objective	This command displays the configured SNMP Notification types.
Syntax	`show snmp notif`
Mode	Privileged EXEC Mode

18

Simple Network Time Protocol (SNTP) Commands

set sntp client

Command Objective This command sets the listening port for SNTP client which refers to a port on a server that is waiting for a client connection. The value ranges between 1025 and 65535.

The no form of this command deletes the listening port for SNTP client and sets the default value.

Syntax

```
set sntp client {enabled | disabled}
```

Parameter Description

- `enabled` - Enables SNTP client module and sends a request to the host for time synchronization.
- `disabled` - Disables SNTP client module and no request is sent to the host for time synchronization.

Mode SNTP Configuration Mode

set sntp client port

Command Objective This command transmits or receives LLDP frames from the server to the LLDP module.

Syntax

```
set sntp client port <portno(1-65535)>

no sntp client port
```

Mode SNTP Configuration Mode

set sntp time-zone

Command Objective

This command sets the system time zone with respect to UTC.

The no form of command resets the system time zone to GMT.

Syntax

```
set sntp client time-zone <UTC-offset value as (+HH:MM /- HH:MM)
(+00:00 to +14:00)/ (-00:00 to -12:00)> Eg: +05:30

no sntp client time-zone
```

Parameter Description

- `+/-` - Sets the client time zone as after or before UTC. Plus indicates forward time zone and minus indicates backward time zone.
- `UTC-offset value as` - Sets the UTC offset value in hours
  - +00:00 to +14:00
  - -00:00 to -12:00

Mode

SNTP Configuration Mode

set sntp time-zone

Command Objective

This command enables the DST (Daylight Saving Time). DST is a system of setting clocks ahead so that both sunrise and sunset occur at a later hour. The effect is additional daylight in the evening. Many countries observe DST, although most have their own rules and regulations for when it begins and ends. The dates of DST may change from year to year.

The no form of this command disables the Daylight Saving Time.

Syntax

```
set sntp client clock-summer-time <week-day-month,hh:mm>

<week-day-month,hh:mm> Eg: set sntp client clock-summer- time
First-Sun-Mar,05:10 Second-Sun-Nov,06:10

no sntp client clock summer-time
```

Parameter Description

- week-day-month - The list is given below;
  - `week` - First, Second, Third, Fourth or Last week of month.
  - `day` - Sunday, Monday, Tuesday, Wednesday, Thursday, Friday or Saturday.
  - `month` - /January, February, March, April, May, June, July, August, September, October, November or December.
  - `hh:mm` - Time in hours and minutes

Mode

SNTP Configuration Mode

set sntp unicast-server

Command Objective	This command enables SNTP server for time synching on the Switch. The no form of this command disables the SNTP server configuration.
Syntax	`set sntp unicast-server {ipv4 <ucast_addr> domain-name <string (64)>}[port<integer(1-65535)>]`
Parameter Description	• `Ucast_Addr` - IP address of the SNTP server • `String` - Domain name • `Integer` - Port number
Mode	SNTP Configuration Mode

show sntp clock

Command Objective	This command displays the current time.
Syntax	`show sntp clock`
Mode	User / Previliged EXEC Mode

show sntp status

Command Objective	This command displays SNTP status.
Syntax	`show sntp status`
Mode	User / Previliged EXEC Mode

19

Spanning Tree Commands

spanning-tree

Command Objective

This command enables the spanning tree operation in the Switch for the selected spanning tree Mode.

Spanning tree operation provides path redundancy while preventing undesirable loops in the network that are created by multiple active paths between stations. It logically breaks such loops and prevents looping traffic from clogging the network.

The no form of this command disables the spanning tree operation in the Switch. The spanning tree operation is automatically enabled in the Switch, once the spanning tree Mode is changed.

ⓘ **NOTE:** The spanning tree operation can be enabled in the Switch only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree

no spanning-tree
```

Mode

Global Configuration Mode

spanning-tree mode

Command Objective

This command sets the type of spanning tree to be executed, enables spanning tree operation and starts spanning tree functionality in the Switch. The current selected type of spanning tree is enabled and the existing spanning tree type is disabled in the Switch.

Syntax

```
spanning-tree mode {mst|rst}
```

Parameter Description

- `mst` - Configures the Switch to execute MSTP for preventing undesirable loops. MSTP configures spanning tree on per VLAN basis or multiple VLANs per spanning tree. The Mode cannot be set as mst, if the base bridge Mode is configured as transparent bridging.
- `rst` - Configures the Switch to execute RSTP for preventing undesirable loops. RSTP provides rapid recovery of connectivity following the failure of a bridge/bridge port or a LAN

Mode

Global Configuration Mode

spanning-tree timers

Command Objective

This command sets the spanning tree timers such as hello time, that are used for controlling the transmission of BPDUs during the computation of loop free topology.

The no form of this command resets the spanning tree timers to its default values. The spanning tree timers are reset to its default value, even if the spanning tree Mode is changed.

ⓘ | NOTE:

The values configured for the spanning tree timers should satisfy the following conditions:

2 * (forward-time - 1) >= max-age, and max-age >= 2 * (hello-time +1)

The STP timers can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

This spanning tree timer's configuration is not supported in PVRST Mode.

Syntax

```
spanning-tree {forward-time <seconds(4-30)> | hello-time
<seconds(1-2)> | max-age <seconds(6-40)>}

no spanning-tree { forward-time | hello-time | max-age }
```

Parameter Description

- `forward-time` - Configures the number of seconds, a port waits before changing from the blocking state to the forwarding state. This value ranges between 4 and 30 seconds. In MSTP, this time configuration is applied for IST root (that is, MSTI 0).
- `hello-time` - Configures the time interval (in seconds) between two successive configuration BPDUs generated by the root Switch. This value should be either 1 or 2 seconds. This value is configured on per-port basis for MSTP and is configured globally for RSTP.
- `max-age` - Configures the maximum expected arrival time (in seconds) of hello BPDUs. STP information learned from network on any port is discarded, once the configured arrival time expires. The spanning tree topology is re- computed after this time interval. This value ranges between 6 and 40 seconds. In MSTP, this time configuration is applied for IST root (that is, MSTI 0).

Mode

Global Configuration Mode

spanning-tree transmit hold-count

Command Objective

This command sets the transmit hold-count value for the Switch. The transmit hold count value is a counter that is used to limit the maximum transmission rate of the Switch and to avoid flooding. This value specifies the maximum number of packets that can be sent in a given hello time interval. This value ranges between 1 and 10.

The no form of this command sets the transmit hold-count to its default value. The transmit hold-count is changed to its default value even if the spanning tree Mode is changed.

NOTE: The transmit hold-count value can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree transmit hold-count <value (1-10)>

no spanning-tree transmit hold-count
```

Parameter Description

- `hold-count` - This value specifies the maximum number of packets that can be sent in a given hello time interval. This value ranges between 1 and 10.

Mode

Global Configuration Mode

spanning-tree priority

Command Objective

This command configures the priority value that is assigned to the Switch.

The no form of this command resets the priority to its default value. The priority value is changed to its default value even if the spanning tree Mode is changed.

In RSTP, this value is used during the election of root. In MSTP, this value is used during the election of CIST root, CIST regional root and IST root.

NOTE: The priority value can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree [mst <instance-id>] priority <value(0-61440)>

no spanning-tree [mst <instance-id(1-64)>] priority
```

Parameter Description

- `mst <instance-id>` - Configures the ID of MSTP instance already created in the Switch. This value ranges between 1 and 64. The special value 4094 can be used only in the Switch that supports PBB-TE. This special value represents PTETID that identifies VID used by ESPs. This option is applicable, only if the spanning tree Mode is set as mst.
- `priority <value(0-61440)>` - Configures the priority value for the Switch and for the MSTI, in RSTP and MSTP respectively. This value ranges between 0 and 61440. The value should be set in steps of 4096, that is, you can set the value as 0, 4096, 8192, 12288 and so on.

Mode

Global Configuration Mode

spanning-tree mst forward-time

Command Objective

This command configures the forward timer of the spanning tree and the no form of the command sets the forward timer to the default value. The forward timer controls the speed at which a port changes its spanning tree state from Blocking state to Forwarding state. The timer value ranges between 4 and 30 seconds.

ⓘ | NOTE:

The values configured for the spanning tree forward timers should satisfy the following conditions:

2* (forward-time - 1) >= max-age, and max-age >= 2 * (hello- time +1)

This command is a standardized implementation of the existing command; spanning-tree timers. It operates similar to the existing command.

The STP forward timers can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree mst forward-time <seconds(4-30)>

no spanning-tree mst forward-time
```

Mode

Global Configuration Mode

spanning-tree mst max-age

Command Objective

This command configures the max-age timer of the spanning tree.The max-age timer denotes the time (in seconds) after which the spanning tree protocol information learnt from the network on any port will be discarded. The timer value ranges between 6 and 40 seconds.

The no form of the command sets the max-age timer to the default value.

ⓘ | NOTE:

The values configured for the spanning tree forward timers should satisfy the following conditions:

2* (forward-time - 1) >= max-age, and max-age >= 2 * (hello- time +1)

This command is a standardized implementation of the existing command; spanning-tree timers. It operates similar to the existing command.

The STP forward timers can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree mst max-age <seconds(6-40)>

no spanning-tree mst max-age
```

Mode

Global Configuration Mode

spanning-tree mst hello-time

Command Objective

This command configures the spanning tree hello time.

The no form of this command resets the hello time to its default value.

The hello time represents the time interval (in seconds) between two successive configuration BPDUs generated by the Switch on the port. This value is either 1 or 2 seconds. This value is applied to all active MSTIs.

ⓘ **NOTE:** This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
spanning-tree mst hello-time<value(1-2)>

no spanning-tree mst hello-time
```

Mode

Global Configuration Mode

clear spanning-tree counters

Command Objective

This command deletes all bridge and port level spanning tree statistics information.

For RSTP, the information contains number of:

- Transitions to forwarding state
- RSTP BPDU count received / transmitted
- Config BPDU count received / transmitted
- TCN BPDU count received / transmitted
- Invalid BPDU count transmitted
- Port protocol migration count

For MSTP, the information contains number of:

- Port forward transitions
- Port received BPDUs
- Port transmitted BPDUs
- Port invalid BPDUs received
- Port protocol migration count
- BPDUs sent / received for each MSTI

ⓘ | NOTE:

The statistics information can be deleted, only if the spanning tree functionality is not shutdown in the Switch. The type of

spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
clear spanning-tree [mst <instance-id>] counters[interface
<interface-type> <interface-id>]
```

Parameter Description

- `mst <instance-id>]` - Clears the statistical counters specific to the MSTP instance already created in the Switch. This value ranges between 1 and 64. This option is applicable, only if the spanning tree Mode is set as mst.
- `interface` - Clears all port-level spanning-tree statistics information for the given port.
  - `<interface-type>` - Clears all port-level spanning-tree statistics information for the specified type of interface. The interface can be:
    - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
    - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
- `<interface-id>` - Clears all port-level spanning-tree statistics information for the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.

Mode Global Configuration Mode

spanning-tree mst max-instance

Command Objective This command configures the maximum number of active MSTIs that can be created. This value ranges between 1 and 64.

The no form of this command resets maximum MSTP instance value to its default value.

ⓘ **NOTE:** This command can be executed successfully, only if the spanning tree functionality is started and enabled in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
spanning-tree mst max-instance <short(1-64)>

no spanning-tree mst max-instance
```

Mode Global Configuration Mode

spanning-tree mst root

Command Objective

This command enables BPDU (Bridge Protocol Data Unit) transmission and reception on the interface.

This command is a standardized implementation of the existing command; spanning-tree priority. It operates similar to the existing command.

The no form of the command disables BPDU transmission and reception on the interface.

NOTE: This command executes only if:

- instance is created
- spanning tree Mode is set as mst.

Syntax

```
spanning-tree mst {instance-id <instance-id(1-64)>} root

{primary | secondary}

no spanning-tree mst {instance-id <instance-id(1-64)>} root
```

Parameter Description

- `instance-id <instance-id(1-64)>` - Configures the ID of MSTP instance already created in the Switch. This value ranges between 1 and 64. This option is applicable, only if the spanning tree Mode is set as mst.
- `primary` - Sets high enough priority (low value) for the Switch so that the Switch can be made as the bridge root of the spanning-tree instance. The priority value is set as 24576.
- `secondary` - Sets the Switch as a secondary root, if the primary root fails. The priority value is set as 28672.

Mode

Global Configuration Mode

spanning-tree mst configuration

Command Objective

This command enters into MSTP configuration Mode, where instance specific and MST region configuration can be done.

NOTE: This command can be executed successfully, only if the spanning tree functionality is started and enabled in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
spanning-tree mst configuration
```

Mode

Global Configuration Mode

name

Command Objective This command configures the name for the MST region.

The name is unique and used to identify the specific MST region. Each MST region contains multiple spanning tree instances and runs special instance of spanning tree known as IST to disseminate STP topology information for other STP instances.

The no form of this command resets the name to its default value.

Syntax

```
name <string(32)>

no name
```

Mode MSTP Configuration Mode

revision

Command Objective This command configures the revision number for the MST region. This value ranges between 0 and 65535.

The no form of this command resets the revision number to its default value.

Syntax

```
revision <value(0-65525)>

no revision
```

Mode MSTP Configuration Mode

instance

Command Objective This command creates an MST instance and maps it to VLANs.

The no form of this command deletes the instance / unmaps specific VLANs from the MST instance.

Syntax

```
instance <instance-id(1-64)> vlan <vlan-range>

no instance <instance-id (1-64)> [vlan <vlan-range>]
```

Mode MSTP Configuration Mode

spanning-tree auto-edge

Command Objective

This command enables automatic detection of Edge port parameter of an interface.

The no form of this command disables automatic detection of Edge port parameter of an interface. The automatic detection of Edge port parameter is disabled, even if the spanning tree Mode is changed.

Once automatic detection is enabled, the Edge port parameter is automatically detected and set. The port is set as edge port, if no BPDU is received on the port. The port is set as non-edge port, if any BPDU is received.

ⓘ **NOTE:** The automatic detection of Edge port parameter can be configured in the Switch, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
spanning-tree auto-edge

no spanning-tree auto-edge
```

Mode

Interface Configuration Mode

spanning-tree - properties of an interface

Command Objective

This command configures the port related spanning tree information for all kinds of STPs. This can be applied for any port, in RSTP/MSTP Mode. This command creates port in STP when Automatic Port Create feature is disabled. The no form of this command resets the port related spanning tree information to its default value. The port related spanning tree information is changed to its default value even if the spanning tree Mode is changed. This command also deletes port in STP when Automatic Port Create feature is disabled.

> **NOTE:** In STP module, whenever a port is mapped to any context, the corresponding port is created irrespective of whether STP is intended to be enabled on that interface. This leads To STP scaling issues and this problem is solved by having control at STP module on the port entry creation at STP module itself.

Syntax

```
spanning-tree [{cost <value(0-200000000)>|disable|link- type
{point-to-point|shared}|port-priority <value(0-240)>}]

no spanning-tree [{cost |disable|link-type|port-priority}]
```

Parameter Description

- `cost <value(0-200000000)>` - Configures the port's path cost value that contributes to the path cost of paths containing this particular port. The paths' path cost is used during calculation of shortest path to reach the root. The path cost represents the distance between the root port and designated port. This value ranges between 1 and 200000000. The configured path cost is used, even if the dynamic pathcost calculation feature or LAGG speed feature is enabled.
- `disable` - Disables the spanning tree operation on the port. The port does not take part in the execution of spanning tree operation for preventing undesirable loops in the network.
- `link-type` - Configures the link status of the LAN segment attached to the port. The options available are:
  - `point-to-point` - The port is treated as if it is connected to a point-to-point link.
  - `shared` - The port is treated as if it is using a shared media connection.
  - `port-priority – (0-240)` - Configures the priority value assigned to the port. This value is used during port role selection process. This value ranges between 0 and 240. This value should be set in steps of 16, that is, you can set the value as 0, 16, 32, 48, and so on. The MSTP puts the interface with lowest number in forwarding state and blocks all other interfaces, if all interfaces have the same priority value. Default value of port priority is 128.

Mode

Interface Configuration Mode

spanning-tree mst- properties of an interface for mstp

Command Objective

This command configures the port related spanning tree information for a specified MSTI in a port.

The no form of this command resets the spanning tree information of a port to its default value.

> **NOTE:** This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
spanning-tree mst <instance-id(1-64)> { cost <value(1-200000000)>| port-priority <value(0-240)> | disable }

no spanning-tree mst <instance-id(1-64)>{cost|port-priority | disable}
```

Parameter Description

- `<instance-id(1-64)>` - Configures the ID of MSTP instance already created in the Switch. This value ranges between 1 to 64.
- `cost<value(1-200000000)>` - Configures the port's path cost value that contributes to the path cost of paths containing this particular port. The paths' path cost is used during calculation of shortest path to reach the root. The path cost represents the distance between the root port and designated port. This value ranges between 1 and 200000000. The configured path cost is used, even if the dynamic pathcost calculation feature or LAGG speed feature is enabled.
- `port-priority<value(0-240)>` - Configures the priority value assigned to the port. This value is used during port role selection process. This value ranges between 0 and 240. This value should be set in steps of 16, that is, you can set the value as 0, 16, 32, 48, and so on. The MSTP puts the interface with lowest number in forwarding state and blocks all other interfaces, if all interfaces have the same priority value.
- `disable` - Disables the spanning tree operation on the port. The port does not take part in the execution of spanning tree operation for preventing undesirable loops in the network.

Mode

Interface Configuration Mode

show spanning-tree - summary, blockedports, pathcost

Command Objective

This command displays spanning tree related information available in the Switch for the current STP enabled in the Switch.

The information contain priority, address and timer details for root and bridge, status of dynamic pathcost calculation feature, status of spanning tree function, STP compatibility version used, configured spanning tree Mode, bridge and port level spanning tree statistics information, and details of ports enabled in the

Switch. The port details contain port ID, port role, port state, port cost, port priority and link type.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree [{ summary | blockedports | pathcost method }] [ switch <context_name>]
```

Parameter Description

- `summary` - Displays the currently used STP, applied path cost method and port details such as port ID, port role, port state and port status.
- `blockedports` - Displays the list of ports in blocked state and the total number of blocked ports.
- `pathcost method` - Displays the port pathcost method configured for the switch.
- `switch <context_name>` - Displays the STP related information in the Switch, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree detail

Command Objective

This command displays detailed spanning tree related information of the Switch and all ports enabled in the Switch.

The information contains status of spanning tree operation, current selected spanning Mode, current spanning tree compatibility version, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, transmit hold- count value, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features.

ⓘ **NOTE:** This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree detail [ switch <context_name>]
```

Parameter Description

- `switch <context_name>` - Displays detailed spanning tree related information, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree active

Command Objective

This command displays spanning tree related information available in the Switch for the current STP enabled in the Switch.

The information contains priority, address and timer details for root and bridge, status of dynamic pathcost calculation feature, status of spanning tree function, STP compatibility version used, configured spanning tree Mode, bridge and port level spanning tree statistics information, and details of ports enabled in the Switch. The port details contain port ID, port role, port state, port cost, port priority and link type.

ⓘ **NOTE:** This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree active [detail] [ switch <context_name>]
```

Parameter Description

- `detail` - Displays detailed spanning tree related information of the Switch and all ports enabled in the Switch. The information contains status of spanning tree operation, current selected spanning Mode, current spanning tree compatibility version, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, transmit hold-count value, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features.
- `switch <context_name>` - Displays spanning tree related information available in the Switch, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree interface

Command Objective

This command displays the port related spanning tree information for the specified interface.

The information contains port ID, port role, port state, port cost, port priority and link type.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree interface <interface-type> <interface-id> [{
cost | priority | portfast | rootcost | restricted-role |
restricted-tcn | state | stats | detail }]
```

Parameter Description

- `<interface-type>` - Displays the port related spanning tree information for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together.
- `<interface-id>` - Displays the information about the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.
- `cost` - Displays the cost of the port or instances assigned to that port.
- `priority` - Displays the priority of the port or instances assigned to that port.
- `rootcost` - Displays the root cost of the port or instances assigned to that port. The root cost defines the pathcost to reach the root bridge.
- `state` - Displays the state of the port.
- `stats` - Displays the port level spanning tree statistics information.
- `detail` - Displays detailed spanning tree related information for the port. The information contains current selected spanning Mode, bridge and root priority, bridge and root addresses, port path cost, port priority, port timers, bridge and port level spanning tree statistics information, link-type, and status of L2GP, loop guard, BPDU receive, BPDU transmit, restricted TCN, restricted role and portfast features.
- `Portfast` - Enabling the PortFast feature causes a Switch or a trunk port to enter the STP forwarding-state immediately or upon a linkup event.
- `restricted-role` - Enables the root-guard feature on the interface.
- `restricted-tcn` - Enables the BPDU-guard feature on the interface.

Mode

Privileged EXEC Mode

show spanning-tree root

Command Objective

This command displays the spanning tree root information. The information contain root ID, root path cost, maximum age time, forward delay time and root port, for the RSTP. The information also contains the instance ID for MSTP.

> **NOTE:** This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree root [{ address | cost | forward-time | id | max-age | port | priority | detail }] [ switch <context_name>]
```

Parameter Description

- `address` - Displays the MAC address of the root bridge.
- `cost` - Displays the cost of the root bridge.
- `forward-time` - Displays the forward delay time of the root bridge.
- `id` - Displays the ID of the root bridge.
- `max-age` - Displays the maximum age time of the root bridge.
- `port` - Displays the ID of the root port.
- `priority` - Displays the priority of the root bridge.
- `detail` - Displays the root priority, root address, root cost, root port, forward delay time and maximum age time.
- `switch <context_name>` - Displays spanning tree root information, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree bridge

Command Objective

This command displays the spanning tree bridge information. The information contain bridge ID, hello time, maximum age time, forward delay time and protocol enabled, for the RSTP.

The information also contains the instance ID for MSTP.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set, if the functionality is already shutdown.

Syntax

```
show spanning-tree bridge [{ address | forward-time | hello-time | id | max-age | protocol | priority | detail }] [ switch <context_name>]
```

Parameter Description

- `address` - Displays the MAC address of the bridge.
- `forward-time` - Displays the forward delay time of the bridge.
- `hello-time` - Displays the hello time of the bridge.
- `id` - Displays the ID of the bridge.
- `max-age` - Displays the maximum age time of the bridge.
- `protocol` - Displays the protocol currently enabled in the bridge.
- `priority` - Displays the priority of the bridge.
- `detail` - Displays the priority, address, maximum age time and forward delay time for the bridge.
- `switch` - Displays spanning tree bridge information, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree mst - CIST or specified mst instance

Command Objective

This command displays multiple spanning tree information for all MSTIs in the Switch.

The information contain MSTI ID, VLAN IDs mapped to the instance, bridge address and priority, root address and priority, IST root address, priority and path cost, forward delay, maximum age, maximum hop count, and port details of interfaces enabled in the Switch. The port details contain interface ID, port role, port state, port cost, port priority and port link type.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
show spanning-tree mst [<instance-id(1-64)>] [detail] [ switch <context_name>]
```

Parameter Description

- `<instance-id(1-64)>` - Displays the multiple spanning tree information for the specified MSTI. This value ranges between 1 to 64.
- `detail` - Displays the detailed multiple spanning tree information for the MSTI. This information contain MSTI ID, VLAN IDs mapped to the instance, bridge address and priority, root address and priority, IST root address, priority and path cost, forward delay, maximum age, maximum hop count, and BPDUs sent and received in the port.
- `switch<context_name>` - Displays multiple spanning tree bridge information, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree mst configuration

Command Objective

This command displays multiple spanning tree instance related information. This information contains the MST region name, MST region revision, and a list containing MSTI IDs and VLAN IDs mapped to the corresponding MSTI.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
show spanning-tree mst configuration [ switch <context_name>]
```

Parameter Description

- `switch <context_name>` - Displays multiple spanning tree instance related information, for the specified context. This value represents unique name of the Switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show spanning-tree mst - port specific configuration

Command Objective

This command displays multiple spanning tree port specific information for the specified port. This information contain interface ID, edge port status, port link type, port hello time,

BPDUs sent and received on the port, and instance related details. The instance details contain MSTI ID, MSTI role, MSTI status, MSTI cost and MSTI priority.

NOTE: This command can be executed successfully, only if the spanning tree functionality is not shutdown in the Switch. The type of spanning tree Mode should be set as mst.

Syntax

```
show spanning-tree mst [<instance-id(1-64)>] interface
<interface-type> <interface-id> [{ stats | hello-time | detail
}]
```

Parameter Description

- `<instance-id(1-64)>` - Displays the multiple spanning tree port specific information for the specified MSTI. This value ranges between 1 to 64.
- `<interface-type>` - Displays the port related spanning tree information for the specified type of interface. The interface can be:
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer upto 1 Gigabit per second.
  - `port-channel` - Logical interface that represents an aggregator which contains several ports aggregated together
- `<interface-id>` - Displays the information about the specified interface identifier. This is a unique value that represents the specific interface. This value is a combination of slot number and port number separated by a slash. For Example: 0/1 represents that the slot number is 0 and port number is 1. Only port-channel ID is provided, for interface type port-channel. For Example: 1 represents port-channel ID.
- `stats` - Displays the number of BPDUs sent and received for the MSTIs assigned to the specified interface.
- `hello-time` - Displays the hello time of the MSTIs assigned to the specified interface.
- `detail` - Displays detailed multiple spanning tree port specific information for the specified interface. The information contain port priority, port cost, root address, priority and cost, IST address, priority and cost, bridge address, priority and cost, forward delay, maximum age, maximum hop count, and BPDUs sent and received.

Mode

Privileged EXEC Mode

20

Secure Shell Commands

ip ssh server

Command Objective	This command enables the ssh system The no form of the command disables the ssh system.
Syntax	`ip ssh server` `no ip ssh server`
Mode	Global Configuration Mode

show ssh configuration

Command Objective	This command displays SSH server status.
Syntax	`show ssh configuration`
Mode	Privileged EXEC Mode

21

Syslog Commands

show logging-server

Command Objective This command displays the information about the syslog logging server table.

Syntax `show logging-server`

Mode Privileged EXEC Mode

show logging

Command Objective This command displays all the logging status and configuration information.

Syntax `show logging`

Mode Privileged EXEC Mode

logging

Command Objective This command enables syslog server and configures the syslog related parameters The logging process controls the distribution of logging messages to the various destinations.

Syntax `logging severity { alerts | critical | debugging | emergencies | errors | informational | notification | warnings }`

Parameter Description

- `severity` - Message severity level. Messages with severity level equal to or high than the specified value are printed asynchronously. This can be configured using numerical value or using the available option. The options are:
  - `0 | emergencies` - System is unusable
  - `1 | alerts` - Immediate action needed.
  - `2 | critical` - Critical conditions.
  - `3 | errors` - Error conditions.
  - `4 | warnings` - Warning conditions.
  - `5 | notification` - Normal but significant conditions.
  - `6 | informational` - Informational messages.
  - `7 | debugging` - Debugging messages.

Mode Global Configuration Mode

logging-service

Command Objective	This command enables/disables syslog server.
Syntax	`logging-service { enable | disable }`
Parameter Description	• `enable` - Syslog enabled. • `disable` - Syslog disabled.
Mode	Global Configuration Mode

clear logs

Command Objective	This command clears the system syslog buffers.
Syntax	`clear logs`
Mode	Global Configuration Mode

logging server

Command Objective

This command configures a server table to log an entry in it.

The no form of command deletes an entry from the server table.

Syntax

```
logging-server {facility {local0 | local1 | local2 | local3 | local4
| local5 | local6 | local7}} {severity { emergencies | alerts | critical | errors | warnings | notification | informational| debugging}} {ipv4 <ucast_addr> |ipv6 <ip6_addr> | <string>} [ port <integer(0-65535)>]
```

Parameter Description

- `facility` - The facility that is indicated in the message. Can be one of the following values: local0, local1, local2, local3, local4, local5, local 6, local7..
- `severity` - Message severity level. Messages with severity level equal to or high than the specified value are printed asynchronously. This can be configured using numerical value or using the available option. The options are:
  - `0 | emergencies` - System is unusable
  - `1 | alerts` - Immediate action needed.
  - `2 | critical` - Critical conditions.
  - `3 | errors` - Error conditions.
  - `4 | warnings` - Warning conditions.
  - `5 | notification` - Normal but significant conditions.
  - `6 | informational` - Informational messages.
  - `7 | debugging` - Debugging messages.
- `ipv4 <ucast_addr>` - Sets the server address type as internet protocol version 4.
- `ipv6 <ip6_addr>` - Sets the server address type as internet protocol version 6.
- `<string>` - Configures the host name for a server to log an entry.
- `port<integer(0-65535)>` - Sets the port number through which it sends the syslog message. The value ranges between 0 and 65535.

Mode

Global Configuration Mode

22

VLAN Commands

vlan

Command Objective

This command creates a VLAN ID and enters into the config- VLAN mode in which VLAN specific configurations are done. This command directly enters into the config-VLAN mode for the specified VLAN ID, if the VLAN is already created.

- `<vlan –id>` - This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.

Syntax

```
vlan <vlan-id>

no vlan <vlan-id>
```

Mode

Global Configuration Mode/ Switch Configuration Mode

ports

Command Objective

This command statically configures a VLAN entry with the required member ports, untagged ports and/or forbidden ports, and activates the VLAN. The VLAN can also be activated using the vlan active command.

Syntax

```
ports [add] ([<interface-type> <0/a-b,0/c,...>] [<interface-
type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-d>]
[pw <a,b,c-d>]) [untagged (<interface-type> <0/a-b,0/c,...>
[<interface-type> <0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw
<a,b,c-d>] [ac <a,b,c-d>] [all])] [forbidden <interface-
type><0/a-b,0/c,...> [<interface-type> <0/a-b,0/c,...>] [port-
channel <a,b,c-d>] [pw <a,b,c-d>][ac <a,b,c-d>]] [name <vlan-
name>]
```

```
no ports [<interface-type> <0/a-b,0/c,...>] [<interface-
type><0/a-b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-d>]
[ac<a,b,c-d>] [all] [untagged ([<interface-type> <0/a-
b,0/c,...>] [<interface-type> <0/a-b,0/c,...>] [port-channel
<a,b,c-d>] [pw<a,b,c-d>] [ac <a,b,c-d>] [all])] [forbidden
([<interface-type><0/a-b,0/c,...>] [<interface-type> <0/a-
b,0/c,...>] [port-channel <a,b,c-d>] [pw <a,b,c-d>] [ac <a,b,c-
d>] [all])] [name<vlan-name>]
```

Parameter Description

- `add` - Appends the new configured ports to the existing member port list of the vlan.
- `<interface-type> <0/a-b,0/c,...>` - Configures the ports that should be set as a member of the VLAN.
- `port-channel<a,b,c-d>` - Sets the list of port channel interfaces or a specific port channel identifier. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- `pw <a,b,c-d>` - Configures the Pseudo wire interface as member port. When the pseudo wire interface is mapped to a specific VLAN, the interface structures are created. This value ranges between 1 and 65535.
  - Maximum number of PseudoWire interfaces supported in the system is 100.
- `ac <a,b, c-d>` - Configures the specified attachment circuit interface as a member port. This value ranges between 1 and 65535. Use comma as a separator without space while configuring list of interfaces. Example: 1,3.
- `all`- Deletes all configured member ports for the VLAN and sets the member ports as none. This option is available only in the no form of the command.
- `untagged<interface-type> <0/a-b,0/c,...>` - Configures the ports that should be used for the VLAN to transmit egress packets as untagged packets.
- `forbidden<interface-type> <0/a-b,0/c,...>` - Configures the ports that should never receive packets from the VLAN.
- `name<vlan-name>` - Configures the unique name of the VLAN. This name is used to identify the VLAN and is an administratively assigned string with the maximum size as 32.

Mode Config-VLAN Mode

exit

Command Objective This command exits the current mode and reverts to the mode used prior to the current mode.

Syntax `exit`

Description This command exits the current mode and reverts to the mode used prior to the current mode.

Mode All mode

switchport pvid

Command Objective This command configures the PVID on the specified port.The PVID represents the VLAN ID that is to be assigned to untagged frames or priority-tagged or C-VLAN frames received on the port. The PVID is used for port based VLAN type membership classification. This value ranges between 1 and 65535.

Syntax

```
switchport pvid <vlan-id>

no switchport pvid
```

Parameter Description

- `pvid<vlan-id(1-4094)>` - Configures the PVID for the provider edge port for the specified VLAN ID. This is a unique value that represents the specific VLAN. This value ranges between 1 and 4094.

Mode Interface Configuration mode (Physical / Port channel)

switchport acceptable-frame-type

Command Objective This command configures the type of VLAN dependant BPDU frames such as GMRP BPDU, that the port should accept during the VLAN membership configuration.

The no form of the command resets the acceptable frame type for the port to its default value.

This configuration does not affect VLAN independent BPDU frames such as GVRP BPDU and STP BPDU. It affects only the VLAN dependent BPDU frames.

Syntax

```
switchport acceptable-frame-type {all | tagged |
untaggedAndPrioritytagged }

no switchport acceptable-frame-type
```

Parameter Description

- `all`- Configures the acceptable frame type as all. All tagged, untagged and priority tagged frames received on the port are accepted and subjected to ingress filtering.
- `tagged` - Configures the acceptable frame type as tagged.
- `untaggedAndPrioritytagged` - Configures the acceptable frame type as untagged and priority tagged. Only the untagged or priority tagged frames received on the port are accepted and subjected to ingress filtering. The tagged frames received on the port are rejected.

Mode Interface Configuration mode (Physical / Port channel)

switchport ingress-filter

Command Objective

This command enables ingress filtering feature on the port.

The ingress filtering is applied for the incoming frames received on the port. Only the incoming frames of the VLANs that have this port in its member list are accepted. This configuration does not affect VLAN independent BPDU frames such as GVRP BPDU and STP BPDU. It affects only the VLAN dependent BPDU frames GMRP BPDU.

The no form of the command disables ingress filtering feature on the port. All incoming frames received on the port are accepted.

Syntax

```
switchport ingress-filter

no switchport ingress-filter
```

Mode

Interface Configuration mode (Physical / Port channel)

show vlan

Command Objective

This command displays VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.

The information contain the member ports, untagged ports, forbidden ports, VLAN name and the status of that VLAN entry.

Syntax

```
show vlan [brief | id <vlan-range> | summary] [ switch <context_name>]
```

Parameter Description

- `brief` - Displays the VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
- `id <vlan-range>` - Displays the VLAN entry related information for specified VLANs alone. This value denotes the VLAN ID range for which the information needs to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the information for VLANs IDs from 4000 to 4010. The information is displayed only for the active VLANs and VLANs (that are not active) for which the port details are configured.
- `summary` - Displays only the total number of VLANs existing in the Switch. This includes only the active VLANs and VLANs (that are not active) for which the port details are configured. The VLAN entry related information is not displayed.
- `switch <context_name>` - Displays the VLAN entry related information or total number of existing VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show vlan device info

Command Objective This command displays the VLAN global information that is applicable to all VLANs created in the Switch / all contexts.

The information contains VLAN status, VLAN oper status, GVRP

status, GMRP status, GVRP oper status, GMRP oper status, MAC- VLAN status, subnet-VLAN status, protocol-VLAN status, bridge mode of the Switch, VLAN base bridge mode, VLAN traffic class status, VLAN learning mode, VLAN version number, maximum VLAN ID supported, maximum number of VLANs supported and VLAN unicast MAC learning limit.

Syntax

```
show vlan device info [ switch <context_name>]
```

Parameter Description

- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show vlan device capabilities

Command Objective This command displays only the list of VLAN features such as traffic class feature, supported in the Switch / all contexts.

Syntax

```
show vlan device capabilities [ switch <context_name>]
```

Parameter Description

- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show vlan port config

Command Objective

This command displays the VLAN related port specific information for all interfaces available in the Switch / all contexts. The information contains PVID, acceptable frame type, port mode, filtering utility criteria, default priority value and status of ingress filtering feature, GVRP module, GMRP module, restricted VLAN registration feature, restricted group registration feature, MAC-based VLAN membership, subnet based VLAN membership, protocol-VLAN based membership and port protected feature.

Syntax

```
show vlan port config [{port < interface-type > <ifnum> | switch <string(32)>}]
```

Parameter Description

- `<interface-type>` - Displays the VLAN related port specific information for the specified interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show vlan statistics

Command Objective

This command displays the unicast / broadcast statistics details of all active VLANs and VLANs (that are not active) for which the port details are configured.

The statistics details include VLAN ID, number of unicast packets received in the VLAN, number of multicast / broadcast packets received in the VLAN, number of unknown unicast packets flooded in the VLAN, number of known unicast packets forwarded in the VLAN, and number of known broadcast packets forwarded in the VLAN.

Syntax

```
show vlan statistics [vlan <vlan-range>] [ switch <context_
name>]
```

Parameter Description

- `vlan <vlan-range>` - Displays the unicast / broadcast statistics details for specified VLANs alone. This value denotes the VLAN ID range for which the details need to be displayed. This value is a string whose maximum size is 9. For example, the value is provided as 4000-4010 to display the details for VLAN IDs from 4000 to 4010. The details are displayed only for the VLANs that are activated and VLANs (that are not active) for which the port details are configured.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show mac-address-table

Command Objective This command displays all static / dynamic unicast and multicast MAC entries created in the MAC address table. These entries contain VLAN ID, unicast / multicast MAC address, unicast backbone MAC address of peer backbone edge bridge, member ports, the type of entry (that is static, learnt and so on), and total number of entries displayed.

Syntax

```
show mac-address-table [vlan <vlan-range>] [address
<aa:aa:aa:aa:aa:aa>] [{interface <interface-type> <interface-id>
| switch <context_name>}]
```

Parameter Description

- `vlan <vlan-range>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string with the maximum size as 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
- `address <aa:aa:aa:aa:aa:aa>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified unicast / multicast MAC address.
- `<interface-type>` - Sets the type of interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show mac-address-table count

Command Objective This command displays the total number of static / dynamic unicast and multicast MAC address entries created in the FDB table. The count is displayed for all active VLANs, VLANs (that are not active) for which the port details are configured, and VLANs for which the MAC address table entries are created.

Syntax

```
show mac-address-table count [vlan <vlan-id/vfi-id>] [ switch
<context_name>]
```

Parameter Description

- `vlan <vlan-id>` - Displays the total number of static / dynamic unicast and multicast MAC address entries created for the specified VLAN ID. This value ranges between 1 and 65535.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode Privileged EXEC Mode

show mac-address-table static multicast

Command Objective

This command displays the static multicast MAC address entries created in the FDB table.

These entries contain VLAN ID to which multicast MAC address entry is assigned, multicast MAC address, member ports, receiver ports, forbidden ports, the status of entry (that is permanent, static and so on), and total number of entries displayed.

Syntax

```
show mac-address-table static unicast [vlan <vlan-range>]
[address <aa:aa:aa:aa:aa:aa>] [{interface <interface-type>
<interface-id> | switch <context_name>}]
```

Parameter Description

- `vlan <vlan-range>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string with the maximum size as 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
- `address <aa:aa:aa:aa:aa:aa>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified unicast / multicast MAC address.
- `<interface-type>` - Displays all static multicast MAC address entries for the specified interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show mac-address-table dynamic unicast

Command Objective

This command displays all dynamically learnt unicast entries from the MAC address table.

These entries contain VLAN ID for which unicast MAC address entry is learnt, unicast MAC address, ports through which the entry is learnt, the status of entry (that is permanent, static and so on), the unicast backbone MAC address of peer backbone edge bridge, and total number of entries displayed.

Syntax

```
show mac-address-table dynamic unicast [vlan <vlan-range>]
[address <aa:aa:aa:aa:aa:aa>] [{interface <interface-
type><interface-id> | switch <context_name>}]
```

Parameter Description

- `vlan <vlan-range>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified VLANs alone. This value denotes the VLAN ID range for which the entries need to be displayed. This value is a string with the maximum size as 9. For example, the value is provided as 4000-4010 to display the entries for VLAN IDs from 4000 to 4010.
- `address <aa:aa:aa:aa:aa:aa>` - Displays all static / dynamic unicast and multicast MAC entries created in the MAC address table for the specified unicast / multicast MAC address.
- `<interface-type>` - Displays all static multicast MAC address entries for the specified interface.
  - `gigabitethernet` - A version of LAN standard architecture that supports data transfer up to 1 Gigabit per second.
- `switch <context_name>` - Displays the VLAN global information that is applicable to all VLANs, for the specified context. This value represents unique name of the Switch context. This value is a string whose maximum size is 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

show mac-address-table aging-time

Command Objective

This command displays the ageing time configured for the MAC address table. This time denotes the interval (in seconds) after which the dynamically learned forwarding information entry and static entry in the MAC address table are deleted.

Syntax

```
show mac-address-table aging-time [ switch <context_name>]
```

Parameter Description

- `switch <context_name>` - Displays ageing time of the MAC address table, for the specified context. This value represents unique name of the switch context. This value is a string with the maximum size as 32. This parameter is specific to multiple instance feature.

Mode

Privileged EXEC Mode

Example: 1

to assign an interface as a member of a vlan as untagged or access port

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10
untagged gigabitethernet 0/10
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port-10 becomes a member of vlan 100 as untagged or access port.

Example: 2

to assign multple interfaces as a member of a vlan as untagged or access port

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10-20
untagged gigabitethernet 0/10-20
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port-10 to 20 becomes a member of vlan 100 as untagged or access port.

Example: 3

to assign an interface as a member of a vlan as tagged or trunk port

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port-10 becomes a member of vlan 100 as tagged or trunk port.

Example: 4

to assign multiple interfaces as a member of a vlan as tagged or trunk port

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10-20
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port 10 to 20 becomes a member of vlan 100 as tagged or trunk port.

Example: 5

to forbid an interface to become member of a vlan as untagged or tagged

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add forbidden gigabitethernet
0/10
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port-10 is not able to join vlan 100 as untagged or tagged (cannot become a member of vlan 100).

Example: 6

to forbid multiple interfaces to become member of a vlan as untagged or tagged

Syntax

```
SWS14-48FPOE# conf t
SWS14-48FPOE(config)# vlan 100
SWS14-48FPOE(config-vlan)# ports add forbidden gigabitethernet
0/10-20
SWS14-48FPOE(config-vlan)# end
SWS14-48FPOE# save
```

Expected results Switch port10 to 20 is not able to join vlan 100 as untagged or tagged (cannot become a member of vlan 100).

Example: 7

to assign an interface as a member of a vlan as tagged or trunk port and make other interface forbidden to that vlan

Syntax

```
SWS14-48FPOE# conf t

SWS14-48FPOE(config)# vlan 100

SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10
forbidden gigabitethernet 0/11

SWS14-48FPOE(config-vlan)# end

SWS14-48FPOE# save
```

Expected results

Switch port-10 becomes a member of vlan 100 as tagged or trunk port and port-11 is not able to join vlan 100 as untagged or tagged (cannot become a member of vlan 100).

Example: 8

to assign multiple interface as a member of a vlan as tagged or trunk port and make other interfaces forbidden to that vlan

Syntax

```
SWS14-48FPOE# conf t

SWS14-48FPOE(config)# vlan 100

SWS14-48FPOE(config-vlan)# ports add gigabitethernet 0/10-20
forbidden gigabitethernet 0/21-30

SWS14-48FPOE(config-vlan)# end

SWS14-48FPOE# save
```

Expected results

Switch port 10 to 20 becomes a member of vlan 100 as tagged or trunk port and port 21-30 is not able to join vlan 100 as untagged or tagged (cannot become a member of vlan 100).

Example: 9

to assign an interface as a member of a vlan as untagged or access port and make other interface forbidden to that vlan

Syntax

```
SWS14-48FPOE# conf t

SWS14-48FPOE(config)# vlan 100

SWS14-48FPOE(config-vlan)# ports add gi 0/40 untagged gi 0/40
forbidden gi 0/41

SWS14-48FPOE(config-vlan)# end

SWS14-48FPOE# save
```

Example: 10

to assign an interface as a member of a vlan as untagged or access port and make other interfaces forbidden to that vlan

Syntax

```
SWS14-48FPOE# conf t

SWS14-48FPOE(config)# vlan 100

SWS14-48FPOE(config-vlan)# ports add gi 0/42-45 untagged gi
0/42-45 forbidden gi 0/46-48

SWS14-48FPOE(config-vlan)# end

SWS14-48FPOE# save
```

23

Voice VLAN Commands

voice vlan state

Command Objective This command Enables / Disables voice vlan in the Switch.

Syntax `voice vlan state [{oui-enabled | disabled | auto}]`

Parameter Description

- `oui-enable` - Enable voice vlan with OUI.
- `disabled` - Disable voice vlan.
- `auto` - Enable voice vlan with LLDP-MED.

Mode Global Configuration Mode

voice vlan id

Command Objective This command specifies the voice VLAN.

Syntax `voice vlan id <integer(2-4094)>`

Parameter Description

- `<integer(2-4094)>` - VLAN ID.

Mode Global Configuration Mode

voice vlan aging-time

Command Objective This command specifies the voice VLAN aging timeout interval in minutes.

Syntax `voice vlan aging-time <integer(30-65535)>`

Parameter Description

- `<integer(30-65535)>` - Timeout in minutes.

Mode Global Configuration Mode

voice vlan cos

Command Objective This command specifies the OUI Voice VLAN Class of Service (CoS).

Syntax `voice vlan cos <integer(0-7)> [remark]`

Parameter Description

- `<integer(0-7)>` - cos.
- `[remark]` - Specifies that the L2 user priority is remarked with the CoS value.

Mode Global Configuration Mode

voice vlan vpt

Command Objective This command specifies the LLDP-MED vlan priority tag.

Syntax

```
voice vlan vpt <integer(0-7)>
```

Parameter Description

- `<integer(0-7)>` - vpt.

Mode Global Configuration Mode

voice vlan dscp

Command Objective This command specifies the LLDP-MED dscp.

Syntax

```
voice vlan dscp <integer(0-63)>
```

Parameter Description

- `<integer(0-63)>` - dscp.

Mode Global Configuration Mode

voice vlan oui-table

Command Objective This command specifies the voice vlan OUI table.

Syntax

```
voice vlan oui-table {add <ucast_mac> [<string(32)>] | remove
<ucast_mac>}
```

Parameter Description

- `add <ucast_mac>` - Add voice device mac address prefix to OUI table.
- `[<string(32)>]` - Voice device prefix description.
- `Remove <ucast_mac>` - Remove voice device mac address prefix from OUI table.

Mode Global Configuration Mode

voice vlan enable

Command Objective This command specifies the OUI voice vlan enable/disable on interfaces.

Syntax

```
voice vlan enable

no voice vlan enable
```

Mode Interface Configuration Mode

voice vlan cos mode

Command Objective This command specifies the OUI voice vlan cos mode on interfaces.

Syntax

```
voice vlan cos mode {src | all }
```

Parameter Description

- `src` - QoS attributes are applied to packets with OUIs in the source MAC address.
- `all` - QoS attributes are applied to packets that are classified to the Voice VLAN.

Mode Interface Configuration Mode

show voice vlan

Command Objective Show voice vlan state.

Syntax

```
show voice vlan [oui-table]
```

Parameter Description

- `[oui-table]` - Specifies OUI table.

Mode Privileged EXEC Mode

SonicWall Support

Technical support is available to customers who have purchased SonicWall products with a valid maintenance contract.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. To access the Support Portal, go to https://www.sonicwall.com/support.

The Support Portal enables you to:

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- Register for training and certification
- Request technical support or customer service

To contact SonicWall Support, visit https://www.sonicwall.com/support/contact-support.

About This Document

ⓘ | **NOTE:** A NOTE icon indicates supporting information.

ⓘ | **IMPORTANT:** An IMPORTANT icon indicates supporting information.

ⓘ | **TIP:** A TIP icon indicates helpful information.

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End User Product Agreement

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